Maritime Resource
Research Limited

Open File Report 90-4

FURTHER CHARACTERIZATION OF PLYMOUTH Mn DEPOSIT, NEW BRUNSWICK

by

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Canada-New Brunswick Mineral Development Agreement
Entente Canada-Nouveau-Brunswick L'Exploitation Minérale

Natural Resources and Energy New Brunswick
Ressources Naturelles et Énergie Nouveau-Brunswick
Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

Price $48.50

This report has been prepared for:

Minerals and Energy Division
Department of Natural Resources and Energy
New Brunswick

Hon. Morris Green, Minister

February, 1990

FURTHER CHARACTERIZATION

OF PLYMOUTH Mn DEPOSIT, NEW BRUNSWICK

This project was funded under the Canada-New Brunswick Mineral Development Agreement, a subsidiary agreement under the Economic and Regional Development Agreement.

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February, 1990

Report No.: Open File Report 90-4

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Catalogue No.: ISSN 0712-4562

90-03192/

This report should be referenced in the following manner:

ROBERTS, G.C. and PRINCE, J.D. 1990. Further characterization of Plymouth Mn deposit, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 90-4, 362 p.

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M.I.S.P. PROJECT 8703 - 21J4

FURTHER CHARACTERIZATION OF PLYMOUTH Mn DEPOSIT

Completed on M.R.R.'s Woodstock Mn Claims

Febuary 27, 1988.

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N.T.S. 21J4
Mineral Claims : 4124 - 4149
4360 - 4373
4375 - 4384
4389
4351 - 4356

This Project was co-funded by M.R.R. and the Canada - New Brunswick Mineral Developement Agreement.

Volume 1 of 2

PROJECT SUMMARY

The project, "Further Characterization of Plymouth Mn Deposit", was completed through M.I.S.P. (#8703-21J4).

The project outlined in excess of 9.5 million tons of ore, grading 12.0% Mn (15.49% MnO) and 17.86% Fe (25.54% Fe_2O_3) at the Plymouth Ore Body.

This represents an overall increase of 60% Mn grade from the Wittteck - M.D.A. sampling, completed in 1986-1987.

A further 20-30 million tons of ore could exist at Plymouth. Grade and tonnages agree very well with the 1958 Stratmat estimates.

The structure of the Plymouth iron-manganese body is lensoid in three dimensions. The body is contained within the lower Smyrna Mills Formation. It is bound within a doubly inward plunging upright syncline.

The M.I.S.P. project included the completion of two surface trenches crossing the ore zone, each approximately 500 feet long, situated 540 feet apart. Four drill holes were completed totalling 2086 feet. Two holes were located beneath each trench. A total of 196 samples were prepared from the trenches and drill core. Each sample was analyzed for 58 elements.

Various thin sections were prepared and studied for the detailed mineralogy. Statistical and Grade-Tonnage Calculations were performed on the project.

The potential for development at the Plymouth Ore Body is much greater with the completion of this M.I.S.P. project. It is recommended that another M.I.S.P. project be established with Maritime Resource Research Ltd., to evaluate the processing - economic feasibility studies with this new grade of 12.0% Mn.

ACKNOWLEDGEMENTS

This project was completed by M.R.R. - Maritime Resource Research Ltd. through the Mineral Investment Stimulation Program (M.I.S.P.) of the New Brunswick Mineral Development Agreement (N.B.M.D.A.) with the Federal Government of Canada.

The total cost of the project was shared between M.R.R. and M.I.S.P., with M.R.R. contributing 62%, and the Federal Government, through the management of the Provincial Government of N.B., contributing the remaining 38%.

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1. INTRODUCTION

1.1) Project Objectives:

The project, "The Further Characterization of Plymouth Mn Deposit", was completed through the Mineral Investment Stimulation Program.

The objective of the project was to evaluate the Plymouth Manganese - Iron Deposit, in an attempt to establish an accurate description of the deposit. All work was completed to bring the deposit closer to the development of the orebody and production.

The major objectives of the project were:

a.) To clearly define the grades of Mn and Fe present at Plymouth.
b.) To supply an accurate estimate of all associated elements in the deposit.
c.) To define the boundaries of the deposit.
d.) To present a geological and structural interpretation of the deposit.
e.) To evaluate the deposit at depth.
f.) To provide tonnage figures of the proven, probable and possible ore reserves.
g.) To develop a three-dimensional model of the deposit.

All objectives were to promote the development of the strategic ore reserves present in the Woodstock area.

1.2) Scope of the Project:

The project was divided into three main programs; bulk sampling and trenching, core drilling, and the sample analysis program.

1.2.1) Bulk Sampling and Trenching

Two cross-sections of the deposit were completed, and at each section a surface trench was excavated with each trench being approximately 500 feet (152 meters) long.

The two sections, placed 540 feet (164 meters) apart, were positioned to cross the magnetic outline of the deposit. After each trench was excavated, the surface was cleaned and the bedrock was mapped.

Sampling was then completed with two sizes of samples being taken. First, a small sample for analytical purposes was taken, with approximately 10 pounds removed from each 20 feet in the trench. A second larger sample of about 150 pounds per 20 feet was taken for further metallurgical work. Sampling was continuous along the length of the trenches.

1.2.2) Drilling Program

At each trench, two drill holes were completed to cross-section the deposit at depth. Four holes, totalling 2086 feet (636 meters) were completed.

The holes were positioned and drilled to depth to detail the geological structure of the deposit of each section.

Drill holes DDH-87-2 and DDH-87-3 were completed under Trench 1 and holes DDH-87-4 and DDH-87-5 were completed under Trench 2. Each pair of holes consisted of one short and one long hole.

Once drilled, all core was logged, cut in half and sampled.

1.2.3) Element Analysis

The trench analysis samples and drill core samples were prepared and then sent for assay of their mineral content.

A total of 58 elements were analyzed, including all elements which had been identified in previous work as having the potential to increase the value of the Mn-Fe orebody. Rare earth, specialty metals, precious metals and base metals all were examined.

In addition to the samples assayed, several thin sections were prepared from the drill core. Detailed microscopic examinations of the thin sections was completed to identify the associated minerals as well as to the aid of the geological interpretation.

From the information of the surface trenches, drill core samples and element analysis, a geological interpretation of the deposit was completed. Grades of Mn and Fe and tonnages of the ore were calculated to meet the rest of the objectives of the study.

1.3) Background:

1.3.1) The Claim Group

The Woodstock Mn Claim Group consists of fifty-seven mineral claims numbered:

4124 - 4149
4360 - 4373
4375 - 4384
4389
4351 - 4356

These claims were staked in the summer of 1984 for M.R.R. - Maritime Resource Research Ltd., License #13404. The claim group covers the following Manganese - Iron deposits:

Plymouth
North Hartford
South Hartford
Moody Hill
Iron Ore Hill

Early estimates by Sidwell (1958), place reserves of these deposits at approximately 200,000,000 tons grading 9% Mn and 13% Fe. All claims are held in good standing.

The work completed in this program was concentrated on the Plymouth Orebody, located at the south-western portion of the claim group. Work was performed on claims 4124, 4125, 4126, 4127, 4128 and 4129, as shown on the Work Index Map in Appendix 6.

The Plymouth Deposit was originally estimated at 51,000,000 tons of 11% Mn and 14% Fe, by Sidwell (1958).

1.3.2) Location and Access

The claim group is located in west-central New Brunswick on the outskirts of the town of Woodstock (Figure 1). The claims are situated in Carleton county, the National Topographic System designation is N.T.S. 21-J-4. The approximate center of the claim group is located at Latitude 46 degrees 11 minutes North, and Longitude 67 degrees 39 minutes West. A detailed location map of the claim group is shown in Figure 2.

The Plymouth Deposit is positioned just off Highway 95 to Houlton, Maine, North 1/4 mile on the Plymouth Road, which acts as the western edge of the claim group.

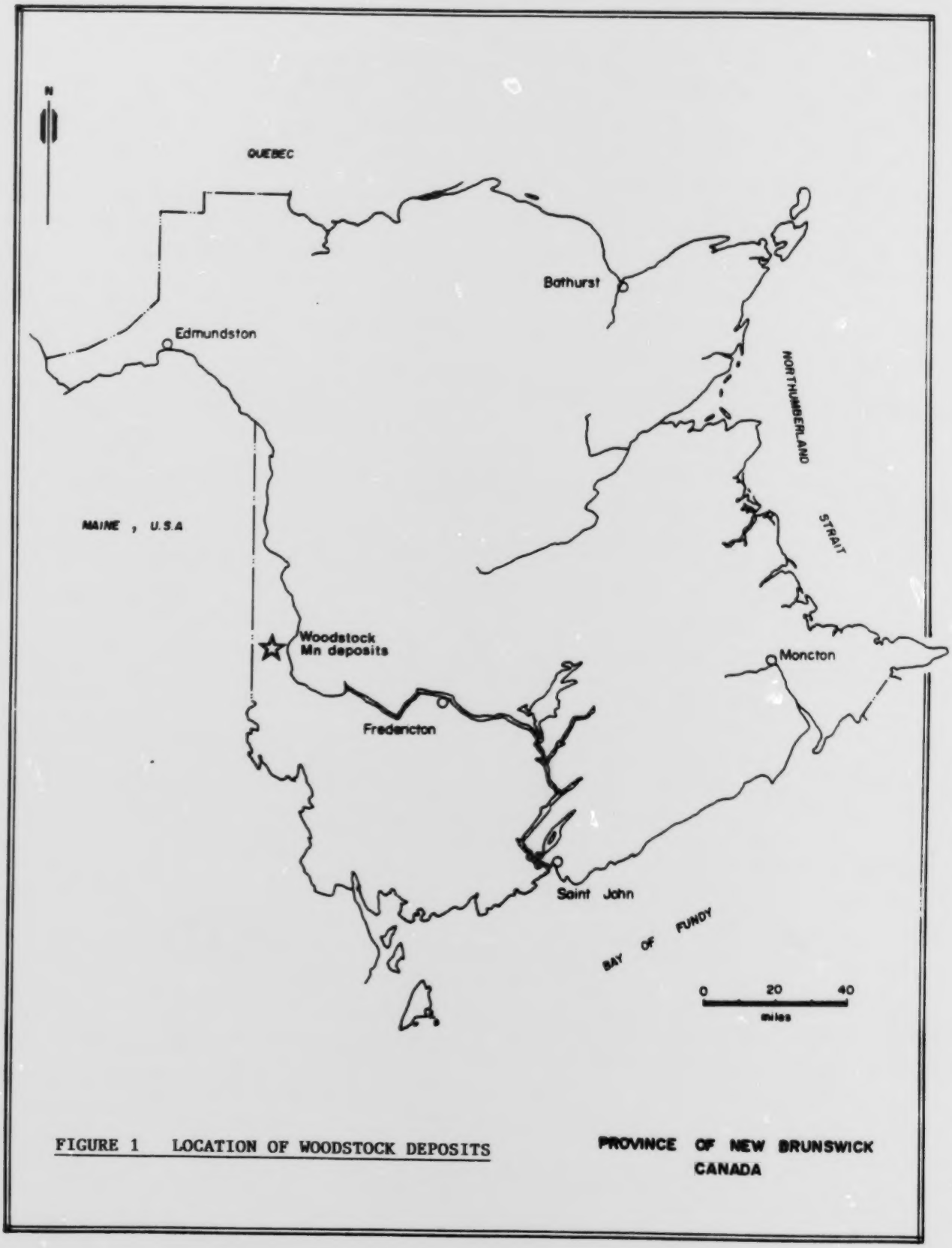
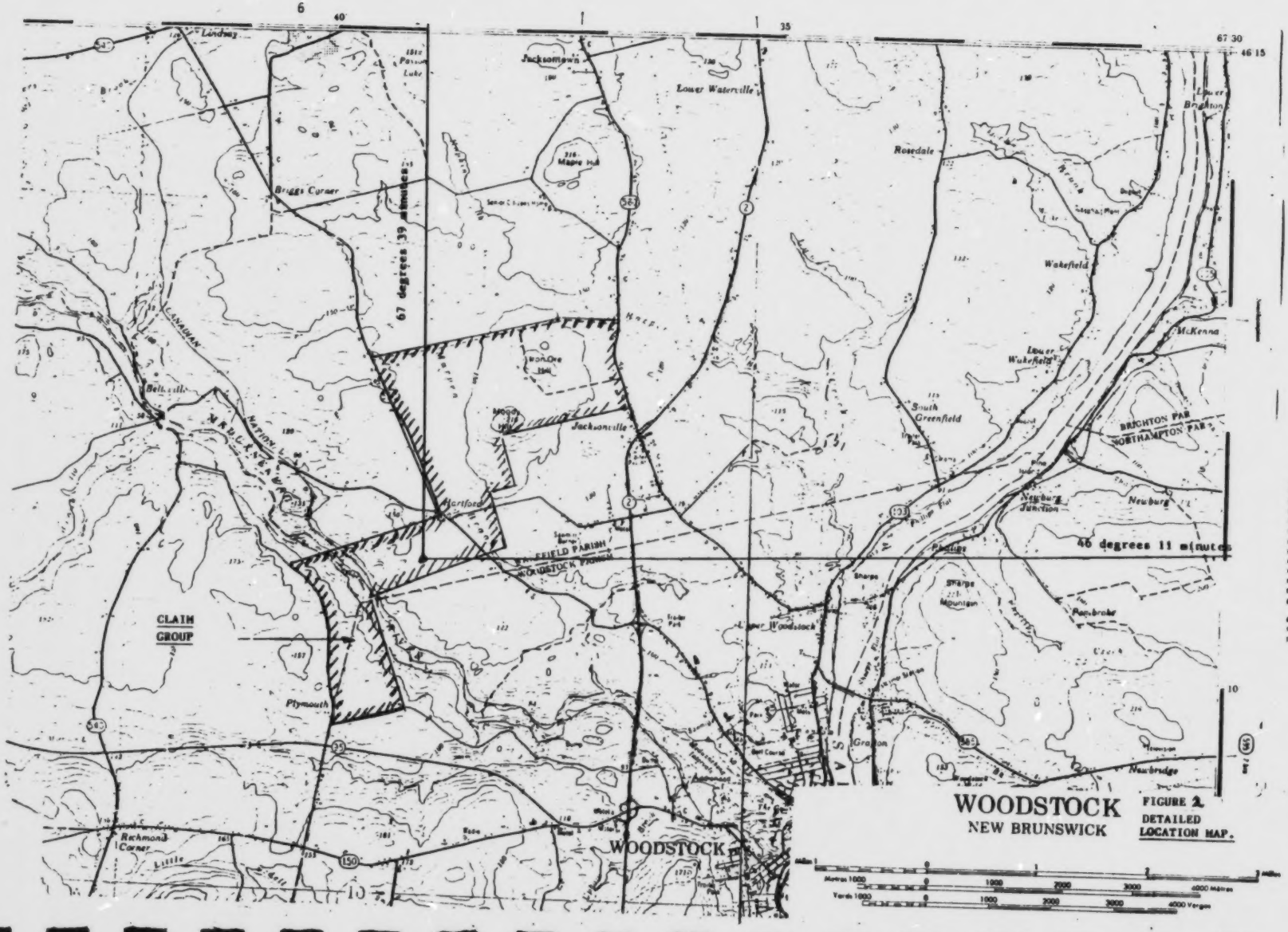


FIGURE 1 LOCATION OF WOODSTOCK DEPOSITS

PROVINCE OF NEW BRUNSWICK
CANADA



WOODSTOCK
NEW BRUNSWICK

FIGURE 2.
DETAILED LOCATION MAP.

Access into the Plymouth Deposit is possible on the old mine road, which runs East from Plymouth Road down to the old trench and further to a small creek and along the edge of the farm fields.

1.3.3) Geographic - Topographic Setting

The area covered by the deposits is generally underlain by Silurian slates, which erode easily producing gently rolling, well-drained hardwood hills and farmland.

At the Plymouth Deposit, the elevation is highest along the Plymouth Road on the western edge of the claims. From an elevation of approximately 125 meters AMSL, the land rolls down gently to the Meduxnekeag River Valley at 25 meters AMSL. The last portion, from the valley edge down to the river level, is quite steep. The elevation also decreases from Claim 4129 to the southern boundary road.

The majority of Claims 4124 and 4125 are covered by farm fields which are used by the surface land owner to grow turnips. North of Claim 4129 are many farm/residencial properties. Three small creeks drain the area of the deposit West to East into the Meduxnekeag River. One spring is also present in the old Stratmat trench.

Overgrown apple orchards, farm fields and some stands of mature softwood trees cover the Plymouth Deposit. The surface lots covering the Plymouth Deposit are # 10168797, # 10168821, and # 10168789. All these lots are owned and farmed by Mr. Herman Haynes, who was shown the planned trench and drill hole locations. Some changes, to the location and length of the trenches, were made at Mr. Haynes' request. Mr. Haynes resides on Lot # 10168821, just to the south of the deposit.

1.3.4) Regional Geological Setting

1.3.4.1) General Geology

An Ordovician-Silurian Belt of sedimentary siltstones and slates, containing the iron-manganese deposits, extends over much of Western, North-Western New Brunswick, and Maine.

It has been most recently referred to as the Matapedia Covering Sequence, L.R. Fyffe (1987).

All available sources of geological research on the area have been reviewed. The geological descriptions presented here are adaptations of this previous research, in light of M.R.R.'s current field work.

The rocks of the Matapedia Belt in the mapped area, have been broken down into two categories:

1) The Carys Mills Formation, part of the Matapedia group, (Upper Ordovician to Lower Silurian).
2) The Smyrna Mills Formation, part of the Perham group, (Lower Silurian to Upper Silurian).

The major deformational period of folding and faulting, that these formations have been subjected to, occurred during the Acadian Orogeny, which dates from early to middle Devonian times.

Within the Plymouth area, the macroscopic structural fold system is described as being tightly oppressed and symmetrical in style, and having a north-east trending axis, Hamilton-Smith (1970).

From the distribution of bedding plane poles, Hamilton-Smith determined that two domains (fold styles) have been impressed into the sedimentary sequence. "Domain A" is the major north-east fold style. "Domain B" is more localized around the major north-east trending Woodstock fault.

The predominate "Domain A" folds trend 022 degrees NE and are slightly overturned to the South. Their axial planes range from vertical to 85 degrees NW, and plunge gently from 4 degrees NE to 4 degrees SW. "Domain B" overprints the older "A" fold pattern, and in some areas north-west trending axis can be defined. The axial plane to this second fold pattern lies at approximately 320 degrees and dips 80 degrees North.

Within the Carys Mills Formation are parasitic folds asscoiated with these major "A" folds. They can have steeper plunges ranging from 60 degrees SW to 60 degrees NE and can attain wavelengths exceeding 5 meters. Reversals in plunge can occur on scales up to 20 meters.

From plots of bedding and cleavage poles on stereonets, the cleavage is almost parallel to the general 022 degree trend of bedding. They suggest the cleavage was produced during the "Domain A" fold period and is axial plannar cleavage.

1.3.4.2) Stratigraphy of the Rocks Hosting the Plymouth Body

There are two different sedimentary formations in the Plymouth area.

The oldest, the Carys Mills Formation, is part of the Matapedia Group of grey slates/siltstones, calcareous grey slates and limestones. It is believed to be up to 1500 feet (450 meters) thick within the area.

It is typically very thinly bedded, calcareous and generally very regular along strike. Determination of the mappable structure on outcrop scale can be difficult, due to internal homogenity of the beds. This formation is conformably overlain by the Smyrna Mills Formation.

The Smyrna Mills Formation has been divided into upper and lower members. The lower member consists of dark grey to black, non-calcareous, non-laminated slates and siltstones, which weather green-grey. This unit predominates the lower member of

this formation. It can be non-distinguishable from the Carys Mills Formation, and the upper member of the Smyrna Mills Formation.

This lower member reaches a thickness of 700-1500 feet (200-450 meters), while the distinctive iron formation has been estimated to average a true thickness of 50 feet (15 meters).

Conformably overlying the lower member is the Upper Smyrna Mills member, which consists of calcareous slate, dark grey shale, minor grey siltstones, conglomerates and minor limestone. This unit attains thicknesses of 5000 feet (1750 meters) within the area of study.

1.3.5) History of the Deposit / Previous Work

The iron-manganese deposits of Iron Ore Hill and the Woodstock area were developed and put into production from the 1850's to the 1890's. A detailed account of this early iron-making history is included in Potter (1978). The more recent work began in 1943, when it was examined by Noranda Mines Limited, using flotation to produce Mn and Fe concentrates.

Regional scale mapping was completed by W.S. White (1943) for the State of Maine.

In 1952, the New Brunswick Resources Development Board completed a review of New Brunswick manganese occurrences, (Sidwell, 1952).

Between 1953 and 1960, the deposits were held by Stratmat, Strategic Materials Corporation. Conducting a gravity survey from the Iron Ore Hill area to Maine, Stratmat discovered the North-South Hartford Deposits and the Plymouth Deposit. They completed geological and magnetic surveys. Approximately 35,000 feet of drilling was completed, 17,000 feet of which was at Plymouth. From their exploration, they calculated Plymouth as holding 51,000,000 tons of 13.3% Fe and 10.9% Mn. In total, they felt the Woodstock Deposit contained 200 million tons of 13% Fe

and 9% Mn.Stratmat conducted detailed processing work to extract the Mn, their results were unsuccessful.

L. Pavlides and A.J. Bancot (1964) completed further mapping and analysis in the State of Maine.

In 1968, F.D. Anderson completed the Geological Survey of Canada's Memoir 353 on the Woodstock area.

In 1972, T. Hamilton-Smith completed Report of Investigation #15 on the Woodstock area for New Brunswick Natural Resources.

In 1973, D.J.J. Carroll produced a geological complimation map of the area for New Brunswick Natural Resources.

In the 1970's, the Mandale Refining Company held the claims. They developed a method of roasting pyritic wastes and the Mn-Fe ore, but after metallurgical problems they abandoned the claims.

Mapping of the region was completed by D.V. Venugopal (1977) for New Brunswick Natural Resources.

Between 1976 and 1980, Minuvar Limited held the claims. R.P.C. completed geological and geophysical surveys over the claims and also examined uses of sulphide roasting on the ores.

In 1984, M.R.R., Maritime Resource Research Ltd. staked 57 mineral claims to cover the iron-manganese deposits. In 1985, M.R.R. also completed a geological survey over the Plymouth Orebody and drilled one hole to a depth of 357 feet; our report entitled, "Exploration Report on M.R.R.'s Woodstock Mn Property", by G.C. Roberts.

In the fall of 1985, Tim Webb and Don Barnett of New Brunswick Natural Resources, collected samples from Plymouth and R.P.C. conducted some mineralogy work on the samples. Report: "Mineralogy of Plymouth Manganese Deposit", by R.P.C., 1986.

In 1986, a sampling program was completed under the N.B.M.D.A. Work was completed by Atlantic Analytical Services and R.P.C. Five samples from Plymouth and three samples from South Hartford were taken for mineralogy and grade determination. Report: "Sampling and Analysis of New Brunswick Manganese Deposits", by Atlantic, 1986.

In 1986, under the N.B.M.D.A., Witteck Development Inc. of Ontario, completed a detailed processing study on the Atlantic Analytical samples. Further work included cost estimates of production and processing facilities for various Mn products. Report: "Process Evaluation of Selected Options for Treating New Brunswick Manganese Mineral Deposits", by Bartlett, 1987.

Further work, under the N.B.M.D.A. in 1986, was a market study for manganese products produced from New Brunswick. Report: "Study of the Non-Metallurgical Market for Manganese Ore", by Day & Associates, 1987.

In 1987, by M.R.R., Maritime Resource Research Ltd., further work was completed which resulted in this M.I.S.P. project.

1.3.6) Reasons For This Program

The original estimates made by Stratmat on the Plymouth Deposit showed an average of 11% Mn and 14% Fe, and described high-grade portions grading up to 14% Mn. These values had been assumed to be accurate, although the records of the detailed surveys and drilling results were not available for review.

When sampling was completed by Atlantic Analytical Services under the M.D.A. in 1986, the original grades were not reproduced. The overall grade of the Plymouth Deposit was considered to be at 7.56% Mn.

Drilling by M.R.R. in 1985, had assayed values up to 28% Mn over small lengths. Samples taken by Webb and Barnett in 1985, also graded higher Mn values.

When M.R.R. surveyed in the locations of the Atlantic samples, they fell in areas outside the magnetic outline of the deposit, contributing to the lower grade. Maritime Resource Research Ltd. continued to view that Stratmat's results were more representative.

The processing studies by Witteck, (1987) were also based on this lower grade Mn material, not the higher grade ore. Witteck's

results showed only marginal process and profit scenarios using the low-grade material. It was felt the high-grade ore would greatly improve all the results of their studies.

Many elements other than Mn and Fe were detected as being anomalous in the several recent development programs. Ga and Ge were identified by the Process Study Group at N.B.N.R.E. Gold and cobalt were found in M.R.R.'s 1985 drilling. These results promoted the need for a complete analysis of the Plymouth Deposit.

It was felt that without an accurate grade calculation and knowing the associated elements, a proper analysis of the potential for future production from Plymouth could not be made.

1.3.7) M.R.R. 1987 Exploration Program

In early spring, the M.R.R. grid line established in 1985, was upgraded and all stations were rechained. A Proton Ground Magnetometer Survey was then completed over the grid, and was successful in outlining the Mn-Fe orebody. All the Magnetometer results are detailed in our report, "1987 Ground Magnetometer Survey Performed on the Woodstock Manganese Property", by J.D. Prince.

A regional review of the Mn-Fe deposit was also begun to assist the geological interpretation of the orebodies. Road sampling of the Mn slate zones also identified anomalous gold values.

In an attempt to determine the depth of the deposit, M.R.R. collared a drill hole. The drilling of this hole was abandoned, as the grey slates began to collapse at the top of the hole. Although this hole was not completed under the M.I.S.P. project, it's results are included in this report to aid in the geological and structural interpretation of the deposit.

M.R.R. has also completed preliminary analysis of low-level radar images flown over the areas to also aid in the geological interpretation.

A large amount of time has been put into obtaining the records of the Stratmat exploration at Plymouth. Discussions with the author, K.O.J. Sidwell, provide first-hand knowledge of the program but no copies of the work. Only recently has M.R.R. obtained the gravity survey results and some of the drill holes. The bulk of 43 drill hole records, completed by Stratmat, are still unavailable.

All information gathered has been used to aid our interpretation, but is not included in the costs of the M.I.S.P. project.

2. PROJECT METHODOLOGY

2.1) Determination of Cross-Section Locations:

Using the magnetic outline of the deposit from M.R.R.'s previous magnetometer survey, the two sections were established.

Trench 1 crosses the deposit and is close to the eastern limit of the magnetic outline. It crosses through both high and lower magnetic regions, allowing for variance of Mn with the magnetic properties of the deposit.

Trench 2 crosses the deposit at almost it's widest part. It is very close to the farm field, which limited any excavation at the very western portion of the magnetic outline. The trench positions are shown in Appendix 7 on the Magnetic Contoured Map.

At the land-owners request, Trench 1 was shortened by 50 feet to 450 feet in length, to avoid cutting a stand of spruce/fir trees. Trench 2 was shifted slightly on the ground, as the original position would have required the movement of an excessive amount of earth, already excavated from the Stratmat Trench. Due to the land-owners' objection, the trench was shifted into the old Stratmat Trench. Trench 2 was extended to cover the extent of the old works which was over 700 feet long.

Drill hole DDH-87-2 was positioned parallel to Trench 1, and in line with previously completed DDH-87-1, to aid in the dip calculation of the red/grey contact on the deposit. DDH-87-3, also at Trench 1, was shifted to the east to be parallel with the holes in Trench 2. Holes DDH-87-4 and DDH-87-5, completed at Trench 2, were placed at the southern portion of the deposit to detail what was felt to be higher-grade zones.

2.2) Excavation of Trenches:

All trees over the sites were cut down, allowing an overall width of approximately 15 feet at each trench. Bulldozing removed all topsoil, and access roads were put in parallel to Trench 1 and at both ends of Trench 2. A small backhoe was contracted to complete the excavations. It became evident that the smaller backhoe could not remove the layer of oxidized Mn material, "gossan cap", over the deposit, therefore, a much larger backhoe was brought in from Fredericton.

In portions of Trench 1 no competent bedrock could be found. Trenching down 18 feet from the surface was completed without any positive results. Offsets from the trench were dug in a hope to define the bedrock. All loose rubble was removed using shovels and brooms, and an air-compressor was then used to blow any fine dust from the surface.

2.3) Surface Thin Sections:

Once preliminary mapping had been completed, a series of "in-situ" thin section sites were located to examine the bedding cleavage, contacts and folding of the rocks. Attempts were made to drill 4 and 6 inch diameter core samples to a depth of 6 inches. Once drilled, it was impossible to remove the samples with bedding planes intact. Samples disintegrated and the procedure was abandoned after eight unsuccessful holes.

2.4) Mapping and Sampling:

Once trenches were cleaned out, all distances were rechained and marked out on the trenches. All mapping was completed under the supervision of J. David Prince.

Mapping was completed on each trench and a concentrated effort was made to map all structural data available. Preliminary lithological maps were drawn, with sample plans based on these drawings.

Sampling was completed over the entire length of the trenches. Individual sample lengths are shown in the sample plans in Appendix 8. Sample size was restricted to a maximum of 25 feet (7.6 meters) of trench.

Two types of samples were taken at each sample location. First, an analytical sample, of approximately 8 pounds was taken, the rock was then broken with the jackhammer over a width of 36 inches down the length of sample. The 8 pounds were then removed to represent the sample. The width of the cuts were extended to about 1 foot and the bulk sample of 150 pounds was removed. A total of 12 samples were taken in Trench 1 and 31 samples in Trench 2 (of each sized sample).

Sampling was not completed in some areas where it was not physically possible. At some sections in Trench 1, no substantial bedrock was encountered and only a small sample could be taken over a very long length (75 feet).

The major fault areas in both trenches were not sampled, as flooding of water and excessive depth limited the ability to retrieve a sample.

All sampling was completed under the supervision of G. Christopher Roberts. Samples were transported to M.R.R.'s Fredericton office and stored. Mineralogy and composition of the samples were rechecked during the final geological review.

2.5) Core Drilling Program:

Four drilled holes were completed under the M.I.S.P. program. A wireline core drill producing a 1.43 inch diameter core (BQ size) was used. All core was boxed and shipped to M.R.R.'s Fredericton office. Drilling operations were supervised by G.

Christopher Roberts. All drill hole information is provided below:

Drill Hole	87-1	87-2	87-3	87-4	87-5
M.I.S.P.	No	Yes	Yes	Yes	Yes
Grid Location	6+50N 16+00E	5+00N 16+90E	3+80N 17+50E	0+40N 15+20E	0+50S 17+50E
Trench Section	1	1	1	2	2
Claim Number	4128	4128	4128	4128	4125
Length (ft)	305	366	635	632	462
Length (m)	93	111.5	193.5	193	141
Core Size	BQ	BQ	BQ	BQ	BQ
Collar Elevation (m)	124	124	124	123	123
Dip	45	45	45	45	45
Bearing (MAG-degrees)	140	140	118	118	118
Start Date	June 1	Sept 15	Sept 30	Nov 1	Dec 1
Completion Date	July 1	Sept 30	Nov 1	Nov 30	Dec 18
Drilling Contractor		DYNAMIC DIAMOND DRILLING			
Core Storage		MRR - FREDERICTON OFFICE			

2.6) Core-logging and Sawing:

Once drill core arrived in Fredericton, it was logged with all structural measurements, including bedding angles, faulting, all veining and fold patterns recorded.

Lithologies and visible minerals were logged, it was then cut in half using a diamond saw. Once a hole was sawn, core was reviewed with respect to lithologies and mineralization. Sawing was completed instead of splitting, as the core tended to shatter along it's bedding planes in the splitter, not allowing proper sample separation.

Core logs for each hole are included in Appendix 15.

2.7) Core Sampling:

Once logged and sawn in half, sample sizes were determined from core logs.

One half of the drill core was removed, placed in a bag and labelled. The other half was retained for review and possible retesting.

Drill holes were sampled along their complete lengths. Sample size and locations are shown in the core logs.

Due to the homogenous units logged in the core, some samples were taken over longer lengths, up to 35 feet.

The sample number and length of each core sample is described in each core log.

2.8) Sample Preparation:

All analytical trench samples and all drill core samples were sent to the Research Productivity Council of New Brunswick in Fredericton.

R.P.C. crushed the samples to 1/8 inch mesh, using a small core crusher, which was cleaned between each sample. R.P.C. then removed a representative 3/4 split from each sample.

All samples and splits were returned to M.R.R. and the splits then sent for analysis.

2.9) Analytical Analysis of Samples:

Sample splits were sent to X-RAY Assay Laboritories of Don Mills, Ontario. X-RAL completed testing for 58 elements on each of the samples.

Samples were crushed to -200 mesh, using an agate mill to avoid possible contamination of chrome and steel. Analysis for

each element and the detection levels for the samples are described below. All results are included in Appendix 1.

Element/Unit:	Method:	Detection Limit:
AU PPB	FADCP	1.
LI PPM	AA	10.
BE PPM	DCP	5.
B PPM	DCP	10.
WRMAJ %	WR	0.01
S PPM	XRF	100.
V PPM	DCP	10.
CR PPM	DCP	2.
CO PPM	ICPMS	1.
NI PPM	DCP	1.
CU PPM	DCP	0.5
ZN PPM	DCP	0.5
GA PPM	ICPMS	1.
GE PPM	DCP	10.
AS PPM	FAA	1.
SE PPM	GFAA	3.
WRMIN PPM	WR	10.
MO PPM	ICPMS	2.
PD PPB	FADCP	2.
AG PPM	DCP	0.5
CD PPM	DCP	1.
IN PPM	ICPMS	1.
SN PPM	XRF	10.
SB PPM	FAA	0.2
CS PPM	ICPMS	1.
LA PPM	ICPMS	2.
CE PPM	ICPMS	1.
ND PPM	ICPMS	0.5
SM PPM	ICPMS	0.5

EU PPM	ICPMS	0.1
GD PPM	ICPMS	0.5
DY PPM	ICPMS	0.5
ER PPM	ICPMS	0.5
LU PPM	ICPMS	0.1
HF PPM	ICPMS	1.
TA PPM	ICPMS	1.
W PPM	ICPMS	3.
PT PPB	FADCP	10.
TL PPM	ICPMS	1.
PB PPM	DCP	2.
BI PPM	ICPMS	0.5
TH PPM	ICPMS	1.
U PPM	ICPMS	0.5

2.10) Thin Sections:

After the drill core was logged and sawn, thin section samples were identified by J.D. Prince. Small 2-4 inch sections of cut core were removed and sent to the Geological Department of the University of New Brunswick. Thin and polished thin sections were then prepared, according to Mr. Prince's specifications.

Analysis of the sections was completed by J.D. Prince at M.R.R.'s Fredericton office. A Nikon Labophot-Polarizing Microscope, with both reflected light and transmitted light units, was used to analyze the sections. Results of each sample are included in Appendix 5.

Due to the fact that very low amounts of any anomalous elements were indicated by the chemical analysis, no S.E.M. work was completed.

3. RESULTS AND DISCUSSION

3.1) Geological Interpretation:

3.1.1) Lithological Description

The Smyrna Mills iron-manganiferous sediments occur in areas lacking sufficient surface outcropping, in which distinctive beds can be traced. A thick cover of sandy to rocky till and oxidized residual soils can exceed 16 feet (5 meters) in depth. At Plymouth, outcrops of the distinctive iron-manganese assemblages have only been observed within the two trenches.

Examination of the trenches and the series of drillholes, logged by M.R.R., has resulted in subdivisions of the iron-manganiferous assemblages. Four siltstone map units and two genetic divisions (assemblages) of a typical metamorphosed iron-manganese deposit have been made:

I - Blue-Grey Calcareous Siltstone.
II A) - Oxide Assemblage Mn-Iron Formation.
II B) - Silicate-Carbonate-Oxide Assemblage Mn-Iron Formation.
II C) - Dark Grey-Green to Green-Black Non-Calcareous Siltstones/Slates.

Unit I - Blue-Grey Calcareous Siltstone:

This is a typical calcareous siltstone/slate of the Carys Mills Formation, Hamilton-Smith (1970). A typical whole rock analysis is shown in Figure 3.

Unit IIA - Oxide Assemblage Mn-Iron Formation:

This map unit can range in color from light or brick-red to very dark blood or maroon-red. This light to dark color variation corresponds to large chemical increases in manganese (MnO) and total iron (Fe_2O_3). The dark beds have much greater amounts of these two minerals.

Both red siltstones (light and dark) are recrystalized and very fine-grained. The following minerals rarely exceed 1/2 millimeter sized grains:

Hematite
Magnetite
Silicates
Lower Oxides of Mn
Secondary Carbonates

The easily identifiable individual beds rarely exceed 1/2 centimeter in width.

Chemical mobilization between the brick-red and maroon-red siltstone has occurred. It is most noticeable when gradual seriate boundaries, between the two red siltstones, are seen cross-cutting the original bedding planes. The present color variations are not solely due to original stratigraphic variations of ph, chemistry, and oxidation potentials of the individual beds. Color variations are instead, the products of chemical-physical imbalances.

The assemblage had been subjected to these imbalances during diagenesis and the period of moderate greenschist conditions. The hetrogenetic differences are also present within the individual beds produced during the sedimentary formation of this assemblage. These variations certainly influenced the final chemistry, mineralogy and color differences between the two different types of oxidized red beds.

Petrological observations of thin and polished sections of this unit show the main manganese minerals as:

30-80% oxides - hematite, magnetite, braunite, pyrolusite, manganite, hausmannite, bixbyite, ilmenite.

30-50% carbonates - rhodochrosite, calcite

5-20% silicates - Mn chlorites, Mn micas, pyroxymangite, rhodonite, tephroite, knebelite.

The carbinates and silicates appear as interbedded layers between carbonate and opaque iron-manganese oxide rich layers. The silicates may represent the recrystalization of the original alumina-siliceous-carbonate rich limey clay layers within oxidizing siltstone.

From Figure 3, the whole rock analysis reveals the brick-red siltstones contain lower iron and manganese percent oxides than do the maroon-red siltstones.

Unit IIB - Silicate-Carbonate-Oxide Assemblage:

This unit is a very fine-grained siltstone, varying in color from grey-green to dark green. The green beds are rich in carbonaceous silicates. Interbedded within these beds are hematitic-siliceous rich oxidized beds. The oxidized beds exhibit the original bedding textures and have been overprinted by the carbonates. These carbonates may be the recrystalized products of the original iron-manganese carbonates, or they may have been introduced into the original assemblage during secondary alteration.

In the outcrops, a randomly chosen 1 meter length of this unit, may exhibit 20 to 30 variations in lithology. These could be individually classified into niches, based on the petrology

and chemistry. Each niche representing individual oxide, carbonate or silicate facies, siltstones. (Sediment Facies of Iron 1954).

A wealth of literature, along with field evidence of the iron formations, suggests that the end-member of the carbonate and hematite (oxide) facies are usually mutually exclusive.

The chemistry of the depositional environment does not change radically with short periods of time. The primary presence of these fine scale 1-2 centimeter interbeds would be unusual. Therefore, it is likely due to the strong modifications in Eh during diagenesis and modifications in bulk chemistry, produced during the period of greenschist metamorphism.

It has not been determined if this assemblage is the result of a unique environment with rapid reverses in Eh and Ph during its' deposition. Then the produced overlapping oxide-silicate and carbonate-silicate facies may have been subsequently altered. This would result in the appearance of secondary "looking" carbonate. Conversely, it is possible that either the carbonate or oxide assemblage-facies has overprinted the other facies.

It is important to understand which minerals are now associated with each other and which minerals were the primary. Petrologically, the thin section analysis suggests the following breakdown of Mn-bearing minerals in this unit:

40-80% carbonates - rhodochrosite, Mn-calcite, Mn-siderolite.

10-20% silicates - Mn-chlorite, Mn-micas, minor magnetite, axinite.

10-20% oxides - braunite, hematite, minor magnetite, pyrolusite, manganite.

Figure 3 reveals the whole rock analysis of this unit. Very high levels of MnO and Fe_2O_3, and decreased SiO_2 and Al_2O_3, are present, in comparison to the other mapped units.

Unit IIC - Dark Grey-Green to Green-Black Non-Calcareous Siltstones:

This siltstone unit possibly correlates with the more common Smyrna Mills lithotype of grey-green to black chloritic siltstone and slate. They are iron-manganese poor, relative to Units IIA and IIB.

These are described in detail by Hamilton-Smith (1970). The whole rock analysis of this unit is included in Figure 3.

FIGURE 3

Typical Whole Rock Analysis of Lithological Units:

Analysis/%	Unit I	Unit IIA		Unit IIB	Unit IIC
		1 Brick - 2 Maroon			
MnO	0.76	10.26	12.89	15.09	2.56
Fe_2O_3	6.94	17.76	24.29	27.65	10.79
S_iO_2	53.10	40.98	31.30	23.57	51.28
Al_2O_3	16.20	13.10	9.90	6.98	17.76
CaO	5.54	1.78	2.24	2.85	1.46
MgO	3.98	2.74	1.77	2.01	2.89
Na_2O	0.90	1.58	1.32	0.22	1.32
K_2O	3.85	2.83	1.94	1.39	4.32
T_iO_2	0.72	0.57	0.43	0.31	0.91
P_2O_5	0.09	0.67	0.98	1.30	0.20
LOI	7.95	7.11	11.82	16.9	6.03

Once the geological units were established, detailed maps were revised and completed. The surface geology plans of Trench 1 and Trench 2 at a scale of 1 inch to 50 feet (1:600) are shown in Appendix 9.

From these plan views and the drill core logs, detailed cross-sections of Trench 1, Trench 2 and DDH-87-3 were drawn, which are shown in Appendix 10.

Once each cross-section was drawn in detail, an overall lithological map was drawn. no detailed divisions were made on the map. all drill holes and trench locations were plotted, including drill hole 54-17 Stratmat, and the M.D.A. trench. This detailed 1 inch to 50 feet (1:600) surface map is shown in Appendix 11.

Using the interpretation of M.R.R.'s 1987 Magnetic Survey, EM-VLF conductors and a portion of the Stratmat Gravity Survey, an interpretation of the overall Plymouth geology was drawn. It is at a scale of 1 inch to 200 feet (1:2400) and is shown in Appendix 12.

3.1.2) Structural Geology of Plymouth

The limited exposures of traceable structural data had to be combined with previous regional studies to produce an overall structural interpretation.

Attempts to define the folding patterns in the cross-sections were unsuccessful. Detailed structural measurements were taken from the drill core. The numerous folds and fold hinges could not be related between the surface trenches and drill holes. The complexity of the folding and faulting patterns has limited the ability to map detailed interpretations of the Plymouth Deposit.

Surface structural measurements are shown on the Plans in Appendix 9. The drill logs contain all structural measurements taken from the core samples.

Regionally, the late Ordovician and Silurian sediments are dominated by a series of North-East trending, upright, similar symmetrical folds. The axial planes of these folds trend 022 degrees NE / 85 degrees N. Individual axial traces exceed 9.5 miles (18 kilometers).

The bedding and subparallel cleavage planes, generally trend on a 020 to 030 degree strike plan. They dip steeply to the north-west at angles ranging from 70 degrees to vertical.

In both trenches the bedding strikes between 020 and 030 degrees. They dip to the north-west at angles between 50 and 90 degrees. The shallower dips are the result of areas influenced by minor folds of 3-6 foot (1-2 meter) wavelengths.

Fl Style Folds:

The "Plymouth" syncline has been projected beyond 15 kilometers, Hamilton-Smith (1970-1971).

The wavelengths of these large North-East (022 degrees) trending folds ranges between 1320 feet (400 meters) and 5280 feet (1600 meters). Locally, within individual outcrops, significant folds of this style can have wavelengths of 60 to 70 feet (18-20 meters). These minor folds have been observed to be plunging South-West and North-East at shallow (20 degrees) to steep (>60 degrees) angles.

Within the two trench areas, all recognized folds trending within this 020-030 degree orientation, parallel to the Plymouth syncline, are designated as F_1 style folds. This F_1 versus an F_2 designation does not genetically mean that all F_1 style folds predate any F_2 style folding, rather, its felt that in general, the F_2 "disturbance" post-dates the 020-030 degree F_1 fold generation.

F2 Style Folds:

In the survey carried out by Hamilton-Smith in 1972, a second style of folds is locally recognized. These are termed "Domain B" zones of cross-folding. The plotting of these domains suggests that this is a heterogeneous system of folds within an axial plane, trending 320 degrees and dipping 80 degrees North.

Within both trenches, a well formed North-West trending crenulation cleavage designated F_2 can be observed. On average, the F_2's trend in a 310-320 degree orientation. Generally, this surface is very upright. Well developed kink bands, commonly ruptured, parallel these crenulations. They have an overall steep North-West plunge greater than 75 degrees.

One poorly exposed, rather open fold, was observed in the South-East end of Trench 1. It trends 310 degrees and has a moderate North-West plunge at 63 degrees.

The interlimb angle within this fold is in excess of 120 degrees. Based on this folds' open style and its orientation, it was classified as being related to the North-West trending crenulation cleavage disturbance.

3.1.3) Faulting and Shearing

The area surrounding and within the Plymouth body, is extensively sheared and major faults cut through the deposit.

The largest fault present exhibits a topographical expression, a geophysical response, (VLF-EM) and physically is indicated by a wide area in drill hole 87-3, in which core recovery was less than 50%.

The lithologies on the north side of this zone, abruptly change from maroon siltstones into south-side green-black siltstones, within drill holes 87-3 and 87-4.

The major fault zone trends around 022 degrees and appears to be near vertical. Within the trenches, many bedding and cleavage

planes parallel the 022 degree trend and exhibit slickenslides along their surfaces. This suggests that the entire iron formation body has undergone 020-030 degree shearing in general.

In addition to the 022 degree trends of dislocation, two other trends of faulting, indicated by a combination of geological mapping and geophysical response, lie in the 030-050 degree trend and in a 090 degree trend.

3.1.4) An Interpretation

It becomes apparent upon examination of the geophysical, magnetic and gravity response of any of the known bodies of Silurian iron formation, that each of these bodies is isolated.

These can be explained as the stratigraphic lensing out of "individual' bodies, eg. the apparent variations in the facies types within the iron formation, between the Plymouth and South Hartford bodies, which are dissimilar.

The descriptions of the many Silurian outcrops, in the Houlton area of Maine, suggest that this division within the Smyrna Mills, is generally an oxidized lithology with varying amounts of primary and secondary carbonatization and silification.

If one accepts that most of this iron formation was originally within a certain horizon within the Smyrna Mills Formation, then it can only be concluded that the present discontinuous lensing of the iron-manganese beds is structurally controlled.

Field evidence suggests that co-axial folding has locally developed semi-parallel to the major flat lying 022 degrees F_1 folds.

These mutually interferring F_1 folds and F_1 co-axial 020-030 degree folds, are overprinted by the F_2 disturbance crenulation cleavage and localized cross-folding pattern. The exact internal

structure of the Plymouth body is unknown. It is suspected the lensing of the iron-manganese deposits is the result of a doubly inward plunging portion of the Plymouth syncline. This creates a local "trough" which has not been eroded down past the iron-manganese horizon within the limits of the body.

The outline of the Fe-Mn body has also been disrupted by the innumerable faults and shear zones, which can be observed throughout both trenches.

This, and the extensive secondary re-equilibration of the silicate-carbonate rich zones, associated within the oxide Fe-Mn assemblage, has resulted in a sequence of structurally unresolved siltstones.

The study of the Plymouth Body has as yet not revealed traceable marker horizons, based on either the chemistry or lithological differences of the major map Units I, IIA, IIB and IIC, or in the finer scale subdivisions present in the cross-sections and geological maps.

3.2) Description of Mineralogy:

A series of thin sections were taken from locations within drill holes 87-2, 87-3 and 87-4. These sections were chosen from various sections of core to provide a representative suite of the different map units.

The identification and examination of the various sedimentary (primary) and recrystalization (secondary) textures, aided significantly the understanding of the mineralogy and the origin of the deposit. The oxide assemblage contains significant amounts of manganese carbonates, and the carbonate assemblage contains primary bedded oxides.

An understanding of "deposit" scale geology must be incorporated into the petrological analysis, to determine the mineralogical conditions.

The textures within the map Unit IIA, oxide facies assemblage, suggest that the original "red" oxide bearing beds are being overgrown and replaced by coarser-grained, secondary carbonates and silicates.

The textures and associations of mineralogy within the map Unit IIB, suggest that this unit contained significant thicknesses of oxide-silicate assemblage, iron-manganese formation, interlayed with thicknesses of carbonate-silicate assemblage iron-manganese formation.

Changes in Eh/Ph during the diagenetic and/or metamorphic periods, have resulted in bulk chemical changes and the recrystalization textures now present within map Unit IIB.

A working interpretation of the formation of the deposit is useful, regarding the projection of grades beyond areas in which data sets have been measured. The interpretation has been aided by studying microscopic mineral relationships, textures and grain size. Descriptions of the 24 thin and polished thin sections are found in Appendix 5. The petrology for map Units IIA - Oxide Assemblage, and IIB - Silicate-Carbonate-Oxide Assemblage is detailed below:

Map Unit IIA - Oxide Facies

Petrologically, this map unit contains the following manganese bearing minerals:

1) Oxides - comprise approximately 30 to 80% of thin sections
minerals present: braunite
pyrolusite
manganite
hausmanite
bixbyite
mn-hematite
mn-magnetite
mn-ilmenite

2) Carbonates - comprise approximately 30 to 50% of thin sections
minerals present: rhodochrosite
mn-calcite

3) Silicates - comprise approximately 5 to 20% of thin sections
minerals present: mn-chlorite
mn-micas
pyroxomagnite
rhodonite
tephroite
knebelite

Map Unit IIB - Silicate-Carbonate-Oxide Facies:

Petrologically, this map unit contains the following manganese bearing minerals:

1) Carbonates - comprise approximately 70 to 80% of thin sections
minerals present: rhodochrosite
mn-calcite
mn-siderite

2) Silicates - comprise approximately 10 to 30% of thin sections
minerals present: mn-chlorite
pennanite
mn-micas
minor tephroite
mn-axinite

3) Oxides - comprise approximately 10 to 20% of thin sections
minerals present: braunite
mn-hematite
pyrolusite
manganite
minor mn-magnetite

3.3) Element Analysis:

3.3.1) Minor Element Analysis

The datailed list of results for 194 trench and drill core samples are shown in Appendix 1. A total of 58 elements were analyzed, other than the major oxides, values for the elements are extremely low.

In an attempt to compare the overwhelming amount of data, univariate statistical calculations were performed. The data from Trench 1, Trench 2, DDH-87-2, 87-4 and 87-5 was acquired in magnetic tape form from X-RAL. Problems with X-RAL computers did not allow DDH-87-3 to be included in the data, at the time of this report.

Samples from the Carys Mills Formation outside the deposit, were removed from the calculations to supply a truer value for the deposit. There were 146 samples used in calculations, all of which were performed as unweighted or equal data sets. No allowance was made to weight them by length, as the results would not change appreciably for the minor amounts present.

The following statistics were calculated: Mean, standard deviation, sum, minimum value and maximum value. For all values less than their detection limit, a standard value was inserted. These values can be seen as the minimum value, if they were not all above the detection limit. All statistical data is in Appendix 2.

The mean values are shown in Figure 4, compared with average "Clarke" crustal abundance values and a level for anomalous values. It must be stressed that the mean value is for an unweighted set of only those samples in the deposit. These results are considered representative of the levels of abundance, not the actual values.

FIGURE 4 STATISTICAL ANALYSIS

	Average Crustal Value	Anomalous Values	NUMBER OF SAMPLES	MEAN	ST. DEVIATION	MIN. VALUE	MAX. VALUE	RANGE OF VALUES	STANDARD ERROR OF THE MEAN
AU	4	100	146.00	3.06	4.82	0.10	30.00	29.90	0.40
LI	60	1000	146.00	37.75	29.48	1.00	230.00	229.00	2.44
BE	2.8	200	146.00	5.32	2.87	1.00	10.00	9.00	0.24
B	10	600	146.00	59.90	34.15	1.00	180.00	179.00	2.83
NA2O			146.00	1.13	0.85	0.00	4.15	4.15	0.07
MGO			146.00	2.37	0.85	0.80	4.83	4.03	0.07
AL2O3			146.00	10.09	4.26	2.42	19.40	16.98	0.35
SIO2			146.00	32.45	11.26	7.08	60.00	52.92	0.93
P2O5			146.00	0.97	0.49	0.05	2.00	1.95	0.04
S	260	5000	146.00	1216.20	1430.25	5.00	8700.00	8695.00	118.37
K2O			146.00	1.94	1.30	0.09	5.21	5.12	0.11
CAO			146.00	2.27	1.16	0.07	4.97	4.90	0.10
TIO2			146.00	0.43	0.17	0.10	0.83	0.73	0.01
V	135	200	146.00	50.42	42.96	1.00	310.00	309.00	3.56
CR	100	1000	146.00	54.30	26.51	0.10	120.00	119.90	2.19
MNO			146.00	13.47	5.57	0.19	27.90	27.71	0.46
FE2O3			146.00	22.85	7.82	7.71	47.20	39.49	0.65
CO	25	880	146.00	101.77	36.31	21.00	220.00	199.00	3.01
NI	75	3000	146.00	63.33	17.73	26.00	110.00	84.00	1.47
CU	55	2000	146.00	56.60	50.65	1.00	410.00	409.00	4.19
ZN	70	5000	146.00	77.28	23.46	29.00	130.00	101.00	1.94
GA	15	500 (?)	146.00	18.95	3.58	11.00	28.00	17.00	0.30

oxides all in % Au in ppb, rest in ppm.

(CONTINUED)

FIGURE 4 STATISTICAL ANALYSIS

	Average Crustal Value	Anomalous Values	NUMBER OF SAMPLES	MEAN	ST. DEVIATION	MIN. VALUE	MAX. VALUE	RANGE OF VALUES	STANDARD ERROR OF THE MEAN
GE	1.5	100 (?)	146.00	2.61	3.65	1.00	20.00	19.00	0.30
AS	1.8	1000 (?)	146.00	34.67	63.73	0.10	300.00	299.90	5.27
SE	0.05	100	146.00	0.10	0.00	0.10	0.10	0.00	0.00
RB	90	?	146.00	62.53	57.76	1.00	211.00	210.00	4.78
SR	375	2000	146.00	236.88	201.67	13.00	1800.00	1787.00	16.69
Y	33	100	146.00	10.94	9.92	1.00	32.00	31.00	0.82
ZR	165	1000	146.00	48.05	38.82	1.00	155.00	154.00	3.21
NB	20	500	146.00	19.05	9.72	1.00	41.00	40.00	0.80
MO	1.5	2000	146.00	9.60	4.52	0.10	33.00	32.90	0.37
PD	5	100-600	146.00	1.97	1.75	0.10	7.00	6.90	0.14
AG	.07	15	146.00	0.10	0.00	0.10	0.10	0.00	0.00
CD	0.2	200	146.00	0.39	0.65	0.10	3.00	2.90	0.05
IN	0.1	100	146.00	0.10	0.00	0.10	0.10	0.00	0.00
SN	2	5000	146.00	1.00	0.00	1.00	1.00	0.00	0.00
SB	0.2	5000	146.00	2.37	3.09	0.20	28.00	27.80	0.26
CS	3	500	146.00	12.92	12.19	0.10	59.00	58.90	1.01
BA	425	10000	146.00	1263.27	1398.87	100.00	9770.00	9670.00	115.77
LA	30	1000	146.00	29.14	6.09	0.00	43.00	43.00	0.50
CE	60	1000	146.00	74.87	13.07	0.10	113.00	112.90	1.08
ND	28	500	146.00	28.72	7.10	0.10	84.00	83.90	0.59
SM	6	500	146.00	5.34	2.13	0.10	28.00	27.90	0.18
EU	1.2	20	146.00	1.69	0.86	0.00	6.10	6.10	0.07

Pd in ppb, rest in ppm

(CONTINUED)

FIGURE 4 STATISTICAL ANALYSIS

	Average Crustal Value	Anomalous Value	NUMBER OF SAMPLES	MEAN	ST. DEVIATION	MIN. VALUE	MAX. VALUE	RANGE OF VALUES	STANDARD ERROR OF THE MEAN
GD	5.4	250	146.00	6.14	1.53	0.10	10.20	10.10	0.13
DY	3	150	146.00	4.53	0.87	0.10	6.50	6.40	0.07
ER	2.8	75	146.00	2.32	0.52	0.10	5.40	5.30	0.04
LU	0.5	18	146.00	0.37	0.23	0.00	2.90	2.90	0.02
HF	3	100 (?)	146.00	1.62	1.12	0.10	4.00	3.90	0.09
TA	2	100	146.00	0.30	0.40	0.10	2.00	1.90	0.03
W	1.5	5000	146.00	3.59	3.44	0.10	17.00	16.90	0.28
PT	10	100	146.00	2.97	4.50	1.00	20.00	19.00	0.37
TL	0.45	?	146.00	0.11	0.07	0.10	1.00	0.90	0.01
PB	12.5	50000	146.00	10.74	12.67	0.10	130.00	129.90	1.05
BI	0.17	100	146.00	0.25	1.25	0.10	14.80	14.70	0.10
TH	9.6	17	146.00	4.84	3.02	0.10	14.00	13.90	0.25
U	2.7	1000	146.00	1.70	1.29	0.10	14.30	14.20	0.11
LOI	-	-	146.00	11.56	5.22	0.80	25.60	24.80	0.43

Pt in ppb, rest in ppm

Through comparison of this chart, 20 elements at Plymouth are below their average crustal abundance. All elements fall well below the significant or anomalous levels. The maximum range of values at Plymouth is five or six times greater than their crustal average. In such minute amounts, the elements are not considered to add any value to the deposit.

Original elements of interest, Au, Co, Ge, and Ga, have the following maximum values in the Plymouth Orebody.:

Au - 30 ppb, Co - 220 ppm, Ga - 28 ppm, Ge - 20 ppm

These amounts are still below what might be called anomalous levels. The Plymouth Iron Formation contains below average amounts of most elements. From these poor results, very little further study can be justified on the associated elements.

3.3.2) Major Oxide Analysis

The major oxides are included in the X-RAL data, and individual sample values can be examined. Weighted values of the major oxides are presented later in the report.

The major oxides were also computed in the unweighted statistical analysis. The mean, standard deviation, sum, maximum and minimum values, were all computed. They are contained in Figure 4. The detailed values are in Appendix 2, with a description of each calculation.

Also included in the univariate statistics, are calculations producing the "Pearson Correlation Coefficients". These are also in Appendix 2. They give an indication of whether two elements are related, and if so, how they are related. It produces a number between +1.00 and -1.00. If the number is positive, it indicates as the first element increases, the other also increases. A negative coefficient indicates as one element

increases, the other decreases. The strength of the correlation is based on how close to -1.0 or +1.0 the value is.

Correlation factors between -0.3 to +0.3 are not considered valid for the sample data. Factors between -0.3 to -0.5 or 0.3 to 0.5 are considered as fair. Factors between -0.5 to -1.0 or 0.5 to 1.0 are considered as good. The coefficients for all elements are also in Appendix 2. The values for MnO against the other major oxides are included here with an interpretation:

MnO: vs	Na_2O	- .48288	decreasing fair
	MgO	- .56611	decreasing good
	AL_2O_3	- .94730	decreasing very strong
	SiO_2	- .95398	decreasing very strong
	P_2O_5	+ .87405	increasing very strong
	CaO	+ .84272	increasing very strong
	TiO_2	- .93258	decreasing very strong
	Fe_2O_3	+ .84482	increasing very strong
	LOI	+ .65767	increasing good

As the MnO content increases in the samples, the Fe_2O_3, CaO and P_2O_5 increase as well, in some cases LOI also increases. TiO_2, SiO_2 and AL_2O_3 all decrease as MnO increases, with Na_2O and MgO usually decreasing as well. This helps identify the chemical association of the elements over the Plymouth Deposit.

3.4) Grade and Tonnage Calculations:

In general, the factors that contribute to the final grade/tonnage values are:

1) Tonnage factor calculations
2) Area, volume, tonnage calculations
3) Grade calculations

The inherant factor, which overlies these reserve calculations, are the divisions of the actual rock into the categories of confidence. The following were used in M.R.R.'s tonnage calculations:

Probable - reserve blocks which are based on sufficient sampling measurements to produce a moderate confidence level to the final results.
ie. reserve blocks which are bordered by more than one sample length section.

Possible - reserve blocks which are based on sufficient sampling measurements to produce a low confidence level to the final results.
ie. reserve blocks which are bordered by one sample length section.

These definitions are modified from accepted APEO reserve definitions, to encompass these exploration stage reserve calculations.

The following sections describe the determination of each factor and provide all assumptions made.

3.4.1) Grade Calculations of Lengths From Trenches & Drill Holes

The individual sample results received from X-RAL represent values over different lengths. All samples were assigned length weight values, produced from the product of grade and length. This was completed for all samples but only for the "whole rock" oxides. For a length of interest, these values were summed up and divided by their overall length, producing the overall grade of the length.

The cross-sections were divided into blocks and the lengths into individual sides of the blocks. These divisions are shown in Appendix 13 for both cross-sections.

The grade of a length = $\dfrac{L_1G_1+L_2G_2+\ldots+L_xG_x}{(L_1+L_2+\ldots L_x)}$

where L_x = individual sample length
G_x = individual sample grade (X-RAL Data) of required oxide

FIGURE 5

Sample Calculations of Weighted Length:

For MnO over length T-2-C (ie. length C of Trench 2)

$$T\text{-}2\text{-}C_{MnO} = (G6_{MnO} * L_6 + G7_{MnO} * L_7) / (L_6 + L_7)$$

$$= ((13.10 * 25) + (12.50 * 25)) / (25 + 25)$$

$$= 647.50 / 50$$

$$= 12.95\%$$

(T-2-C covers samples T2-6 and T2-7) Calculations in Appendix 3 show the average values in column "___Calc" for each element in the rows marked average.

Similar calculations were completed for each length of drill hole and surface trench for all oxide values, even if they fell outside the ore zones. The Mn values are plotted on the cross-sections in Appendix 13. All other oxides are shown in tables in Appendix 3.

3.4.2) Tonnage Factor Calculations

The "tonnage factor" is used to calculate tonnage from a volume of rock. It takes into account the specific gravity (ie. density) of the rock. Rocks of different density have different weights for equal volumes.

Maritime Resource Research Ltd. did not complete specific gravity measurements on the Plymouth ore. From previous work, the range of the specific gravity was 3.2 to 3.8.

Rock Type	Specific Gravity	Source
Manganiferous Hematite	3.8	Stratmat (1958)
Grey-Green "Silified Slates"	3.5	Stratmat (1958)
Re-crystalized Ferruginous Red Siltstone	3.2	Witteck (1987)

The Witteck sample has been classified as: Re-crystalized, ferruginous red siltstone, by M.R.R. This was completed from the sample location and review of the major oxides.

The Plymouth Orebody is divided into several types of geological units.

The wide variances in specific gravity indicated that individual tonnage factors should be calculated for individual zones or blocks. The reserves were calculated on an individual block tonnage factor basis.

FIGURE 6
LINEAR TONNAGE FACTOR CALCULATIONS

	Witteck Sample P-02			Plymouth Sample 87-2-A		
	Weight%	Atomic Weight	Weight*Atomic Weight%	Weight%	Atomic Weight	Weight*Atomic Weight%
Elemental Oxides						
MnO	9.69	125.880	1219.7772	13.66	125.880	1719.5200
Fe2O3	14.80	159.700	2363.5600	22.97	159.700	3668.3100
SiO2	38.70	60.090	2325.4830	30.47	60.090	1830.9400
AL2O3	11.00	101.960	1121.5600	9.53	101.960	971.6800
CaO	6.65	56.080	372.9320	2.78	56.080	155.9000
P2O5	0.55	141.948	78.0714	1.02	141.948	144.7900
K2O	2.59	94.196	243.9676	1.88	94.196	177.0900
MgO	2.50	40.300	100.7500	2.41	40.300	97.1200
Na2O	0.91	61.980	56.4018	0.72	61.980	44.6300
TiO2	0.49	79.900	39.1510	0.42	79.900	33.5600
LOI (total)	11.30	31.000	350.3000	13.62	31.000	422.2200
Total			8271.9540			9265.7600

*LOI has been divided in half for CO2 and H2O, giving a value of 31.0 as the atomic weight.

CALCULATION FOR LINEAR TONNAGE FACTOR 87-2-A

$$\text{TONNAGE FACTOR (87-2-A)} = 2000 + (62.5 * S.G._{87-2-A})$$
$$= 32 + S.G._{87-2-A}$$
$$= 32 + ((3.2 * \text{Sum}_{87-2-A}) + 8271.9540)$$
$$= \frac{82719.540}{\text{Sum}_{87-2-A}} = \frac{82719.540}{9265.76}$$
$$\text{TONNAGE FACTOR}_{87-2-A} = 8.9274 = 9.0$$

Calculation of S.G. Of Sample 87-2-A

$$\frac{S.G._{\text{Witteck}}}{\text{Sum of (wt\%*at.wt)}_{\text{Witteck Oxides}}} = \frac{S.G._{87-2-A}}{\text{Sum of (wt.\%*at.Wt)}_{87-2-A}}$$

$$S.G._{\text{Witteck}} = 3.2$$

$$\text{Sum of (wt\%*at.wt.)}_{\text{Witteck}} = 8271.95$$

$$S.G._{87-2-A} = \frac{3.2*\text{Sum}_{87-2-A}}{8271.9540}$$

The specific gravity of the iron-manganese siltstones varies in direct proportion to the atomic weight and percentage of each oxide.

The specific gravity (tonnage factors) of the various lengths were calculated by directly proportioning the total oxide graded of the length to a standard specific gravity of 3.2, as measured by Witteck Development (1987).

The calculated specific gravity was then used to calculate the tonnage factor. A sample calculation has been included to demonstrate how length tonnage factors have been calculated for each cross-section length. Figure 6 shows the calculation of the linear tonnage factor of 87-2-A. All linear tonnage factors are shown with these calculations in Appendix 4. The linear tonnage factors were then used to compute the block tonnage factors, as shown in Figure 7.

The tonnage factors range from: 8.03 for linear 87-5-B, a high-grade zone in drill hole 87-5, to 11.55 for linear T-1-A, a lower grade zone in Trench 1. Since the MnO and Fe_2O_3 values contribute a large percentage to the total atomic weight of the material, the areas of high Mn-Fe usually have lower tonnage factors.

3.4.3) Area/Volume Calculations

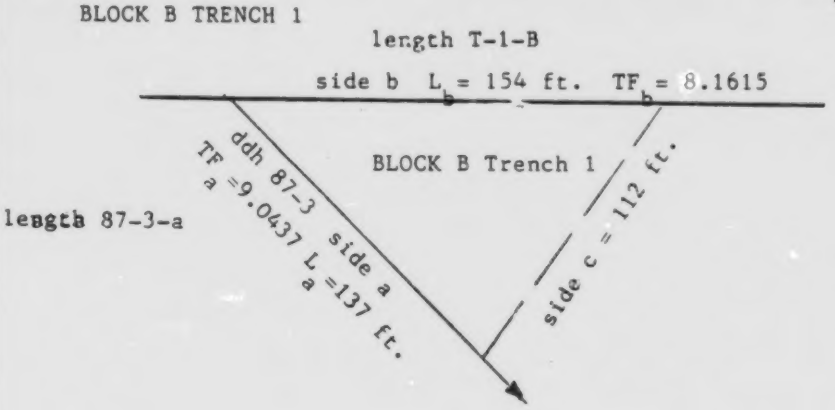
The areas of influence of the surface trenches and drill holes are shown on the cross-sections in Appendix 13.

The majority of the blocks are controlled by the area between the two drill holes and the surface trench. A very limited area of influence is projected below the drill holes.

These assumed areas of influence, below or away from the actual known values, are considered justified due to the overall homogenity of the orebody.

The areas of influence were divided in the different blocks, with the distance between the two sections being approximately

FIGURE 7



Grade of side a
= 10.48 % Mn - 132 ft.

Grade of side b
= 14.27 % Mn - 98 ft.
(from appendix 3)
(all calc's in appendix 3)

BLOCK B TRENCH 1 SAMPLE TONNAGE AND GRADE CALCULATIONS

I) Area Area of Block B = $(s(s-L_a)(s-L_b)(s-L_c))^{-.5}$

where $s = (L_a+L_b+L_c)\div 2 = (137+154+112)\div 2 = 201.5$ ft.

Area of Block B = $(201.5(201.5-137)(201.5-154)(201.5-112)^{-.5}$
= 7,433.2 sq.ft.

II) Volume Volume Block B = Area Block B * 330 ft.
= 7,433.2 * 330 = 2,452955 cu. ft.

III) Weighted Tonnage Factor WTF_B $=((TF_a*L_a)+(TF_b*L_b)) + (L_a+L_b)$
$=((9.0437*132)+(8.1615.98*98))+ (132+98)$
= 8.667
= 8.7 cu. ft. / ton

IV) Tonnage Tonnage of Block B = Volume Block B ÷ WTF_B
= 2,452,955 cu.ft.
8.7 cu.ft./ton
= 281,949 short tons. **********

V) Grade (for Mn) Grade of Tonnage B $=((G_a*L_a) + (G_b*L_b)) + (L_a+L_b)$
$=((10.48*132)+(14.27*98))+ (132+98)$
= 12.10 % Mn **********

L_x = length of side X @

G_x = grade of element in question over side X

TF_x = tonnage factor of side X

@ **N.B.** length of side of area, may differ from the length that grade is over.
in this example L_b = 154 ft. length of side
L_b = 98 ft. for length of grade G_b of 14.27 % Mn.

540 feet. Each sections' area of influence was projected 220 feet towards the other. A zone of approximately 100 feet, at the center, was not included in the volume calculations.

In addition to the 220 foot extension of each profile towards the other, additional volume has been included in the tonnage by projecting each trench profile 110 feet away from the profile.

Each profile has been converted from a two-dimensional area into volume by assuming a length of 330 feet. The conversions of each block volume within either profile, has been converted into a block tonnage (short) by the division of the volume by a weighted tonnage factor.

A sample calculation of the Block B, Trench Profile No. 1, is provided in Figure 7. All overall block area, volume and tonnage results can be found within Appendix 14, which depicts the trench profiles.

3.4.4) Grade Calculations of the Blocks

Each section is now divided into a series of blocks of ore. For the sides of the block, a length weighted grade of each oxide was determined. The grade of the block was calculated, assuming the area of influence of the grade of a side is proportional to the total length of the sides with a known grade.

$$\text{Grade for block} = \frac{G_1S_1+G_2S_2}{S_1+S_2}$$

where G_1 = grade of side
S_1 = length of side

If the length weighted grade of only one side of the block is known, the grade of the block is equal to the grade of that side.

FIGURE 8

WHOLE ROCK VALUES FOR SECTIONS T-1, T-2, AND TOTAL

	Tonnage (s. tons)	MnO	Fe2O3	SiO2	AL2O3	CaO	MgO	Na2O	K2O	TiO2	P2O5	LOI
T-1 Block												
A	645,150	13.61	22.59	30.86	9.61	2.61	2.32	0.94	1.80	0.42	0.99	13.74
E	638,845	13.66	22.97	30.47	9.53	2.78	2.41	0.72	1.88	0.42	1.02	13.62
D	422,263	16.38	25.09	26.08	7.28	2.82	2.61	0.40	1.06	0.31	1.15	16.80
C	1,143,929	16.77	26.70	24.91	6.45	2.85	2.13	0.37	0.94	0.27	1.21	17.31
B	281,949	15.62	25.72	28.16	7.59	2.60	1.98	0.77	1.10	0.32	1.23	14.62
T-1 Prob.	2,493,291	15.75	25.18	27.02	7.54	2.75	2.24	0.57	1.20	0.32	1.15	16.00
T-1 Poss.	638,845	13.66	22.97	30.47	9.53	2.78	2.41	0.72	1.88	0.42	1.02	13.62
T-1 Total	3,132,134	15.32	24.73	27.72	7.95	2.76	2.27	0.60	1.34	0.34	1.12	15.51
T-2 Block												
A	1,694,298	15.40	26.31	28.28	8.67	2.66	1.94	1.02	1.42	0.38	1.20	12.52
B	746,217	15.79	24.56	30.34	9.60	2.43	2.02	1.10	1.82	0.42	1.06	12.27
E (waste)	218,382	3.76	11.96	51.07	17.34	0.49	2.91	1.61	3.84	0.69	0.24	5.58
F (waste)	298,456	3.76	11.96	51.07	17.34	0.49	2.91	1.61	3.84	0.69	0.24	5.58
C	535,781	15.13	24.42	27.61	8.39	2.40	2.37	1.29	1.33	0.36	1.08	15.30
D	813,872	16.34	26.20	25.70	7.47	2.57	2.19	0.89	1.13	0.32	1.20	15.87
I	765,188	17.66	30.03	25.62	7.42	3.40	2.09	1.28	1.36	0.32	1.35	9.20
H	1,196,735	15.66	25.86	29.84	9.04	2.75	2.39	1.51	1.61	0.40	1.12	9.39
G	677,812	14.25	22.91	32.82	10.19	2.30	2.61	1.68	1.79	0.45	0.96	9.53
T-2 Prob.	4,451,122	15.49	25.86	28.57	8.71	2.63	2.12	1.14	1.49	0.38	1.16	12.25
T-2 Prob. + Waste	4,967,960	14.27	24.41	30.91	9.61	2.41	2.20	1.19	1.73	0.41	1.06	11.56
T-2 Poss.	1,978,781	15.80	26.07	28.63	8.63	2.75	2.34	1.42	1.50	0.38	1.14	10.96
T-2 Total	6,429,903	15.58	25.92	28.59	8.69	2.67	2.19	1.23	1.49	0.38	1.15	11.85
T-2 Total + Waste	6,946,741	14.70	24.88	30.26	9.33	2.51	2.24	1.26	1.66	0.40	1.08	11.39
Overall:												
Prob.	6,944,413	15.58	25.62	27.58	7.96	2.67	2.16	0.94	1.39	0.36	1.16	13.60
Prob.+Waste	7,461,251	14.76	24.67	29.61	8.92	2.52	2.21	0.98	1.55	0.38	1.09	13.04
Poss.	2,617,624	15.27	25.31	29.08	8.85	2.76	2.36	1.25	1.59	0.39	1.11	11.61
Total	9,562,037	15.49	25.54	27.99	8.20	2.69	2.21	1.02	1.44	0.37	1.15	13.06
Total+Waste	10,078,875	14.89	24.84	29.47	8.90	2.58	2.25	1.05	1.56	0.38	1.10	12.67

When two sides are known, the calculation produces a weighted grade.

The grade of each block was known as well as the tonnage of the block. The total tonnages of the sections T1 and T2 were calculated . The total tonnages were divided in probable and possible values, as well as overall totals.

A weighted grade of each oxide was calculated for each section and then the total deposit.

$$\text{Grade of section} = \frac{G_1B_1+G_2B_2+\ldots}{B_1+B_2+\ldots}$$

where B_x = tonnage of block x
G_x = grade of block x

3.4.5) Tonnage Results

From the detailed calculations of grades and tonnage, an overall tonnage for each section was produced.

Section T1 was divided into five blocks, A, B, C, D, and E. All block tonnages were considered probable except for "D", which was considered only as possible.

Block	Tonnage (short tons)
A	281,949
B	1,143,929
C	422,263
D	638,843
E	645,150

Tonnage at T1 was 2,493,291 short tons probable, and 638,843 short tons possible, a total of 3,132,134 tons.

The calculated values of the major oxides for each block is shown in Figure 8. The total probable and total possible amounts of ore, with their calculated oxide contents, is also shown.

At T1, 2,493,291 short tons of ore grading 15.75% MnO and 25.18% Fe_2O_3 are present. Including the possible reserves, a total of 3,132,134 short tons of 15.32% MnO and 24.73% Fe_2O_3 are present. The section includes a high-grade block C of 1,143,927 short tons, grading 12.99% Mn or 16.77% MnO.

At section T1, the calculated reserves only reach a vertical depth of 250 feet (76.2 meters). The potential for additional depth is extremely high.

Section T2 was divided into nine blocks, six ,probable and three possible.

Block	Tonnage (short tons)
A - probable	1,694,298
B - probable	746,217
C - probable	218,382
D - probable	298,456
E - possible	535,781
F - possible	813,872
G - possible	765,188
H - possible	1,196,735
I - possible	677,812

Blocks C and D are considered as a waste unit. Their Mn content is only 2.70%. This would have to be removed in mining, although they would not need to be processed. Grade/tonnages figures are calculated with and without these blocks, to show processable tonnage values and mineable tonnage values.

In section T2, block 1 has the highest MnO value of 17.66%. The overall tonnage at section T2 is 6,429,903 short tons at 15.59% MnO, of which 4,451,122 tons probable and 1,978,781 tons possible. Including the waste unit of 516,838 tons, the overall tonnage and grade becomes 6,946,741 tons grading 14.70% MnO (11.39% Mn). Reserve calculations at T2 reach a depth of 550 feet (168 meters).

Together, sections T1 and T2 represent 10,078,875 short tons grading 14.89% MnO (11.89% Mn) and 24.84% Fe_2O_3. Excluding the waste tonnage in T2, the reserves stand at 9,562,037 short tons of 15.49% MnO (12.00% Mn) and 25.54% Fe_2O_3.

The overall grade of 12.00% Mn is very similar to Sidwell's calculation of 51,000,000 tons grading 11.00% Mn. Compared to Witteck's 1987 results of 7.56% Mn, the 12.00% Mn epresents a 60% increase in manganese content. This is of major significance when evaluating Witteck's economic scenarios. An overall grade of 12% Mn may also enable production of higher-grade products. A 35% Mn concentrate may now be possible using the Plymouth ore.

Considering these results, representative of the complete deposit and of the magnetic outline, an additional 20-30 million short tons may be present at Plymouth.

It is recommended that next a complete review of Witteck's processing and economic evaluations be made, using the grade of 12% Mn. This may be possible through another M.I.S.P. project. Maritime Resource Research Ltd. is quite interested in completing this further work.

Overall, the potential for development at Plymouth is much higher with the completion of the M.I.S.P. project. A clearer description of the geology and relationship between the units is beginning to be developed.

4. CONCLUSIONS AND RECOMMENDATIONS

1) In excess of 9.56 million short tons grading 12.0% Mn (15.49% MnO) and 25.54% Fe_2O_3 are present in the Plymouth Orebody.

2) The previous estimate of 51,000,000 tons of 11.0% Mn and 14.0% Fe, by Stratmat (1958), are feasible.

3) The grade is 60% higher at Plymouth than suggested by the Witteck study (1987).

4) The structures of the Plymouth iron-manganese body is lensoid in three dimensions. The working model explanation is that the body contained within the lower Smyrna Mills Formation is bounded within a doubly inward plunging upright syncline.

5) Only the major oxides are present as economical levels. Minor elements and rare earths are present only at their crustal averages.

6) The northern edge of the deposit, at surface, has been identified.

7) No test of the depth of the deposit has been nade below 500 vertical feet. All ore calculations are based on reserves available above this level.

8) It is recommended that a complete review of Witteck's processing and economic evaluations be made, using the revised grade of 12.0% Mn. Maritime Resource Research Ltd. is quite interested in completing this further work, possibly through another M.I.S.P. project.

9) The potential for development is much higher with the completion of this report.

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APPENDIX NUMBER 1

Analysis Results From XRAL

196 Samples

58 Elements

XRAL

CERTIFICATE OF ANALYSIS

REPORT 3319

TO: MARITIME RESOURCE RESEARCH LIMITED
ATTN: G. CHRISTOPHER ROBERTS
301 WOODSTOCK ROAD
FREDERICTON, NEW BRUNSWICK
E3B 2H9

CUSTOMER No. 1417

DATE SUBMITTED
2-Dec-87

REF. FILE 30584-03

Total Pages 14

76 CR.ROCKS

	METHOD	DETECTION LIMIT
AU PPB	FADCP	1.
LI PPM	AA	10.
BE PPM	DCP	5.
B PPM	DCP	10.
WRMAJ %	WR	0.01
S PPM	XRF	100.
V PPM	DCP	10.
CR PPM	DCP	2.
CO PPM	ICPMS	1.
NI PPM	DCP	1.
CU PPM	DCP	0.5
ZN PPM	DCP	0.5
GA PPM	ICPMS	1.
GE PPM	DCP	10.
AS PPM	FAA	1.
SE PPM	GFAA	3.
WRMIN PPM	WR	10.
MO PPM	ICPMS	2.
PD PPB	FADCP	2.
AG PPM	DCP	0.5
CD PPM	DCP	1.
IN PPM	ICPMS	1.

	METHOD	DETECTION LIMIT
SN PPM	XRF	10.
SB PPM	FAA	0.2
CS PPM	ICPMS	1.
LA PPM	ICPMS	2.
CE PPM	ICPMS	1.
ND PPM	ICPMS	0.5
SM PPM	ICPMS	0.5
EU PPM	ICPMS	0.1
GD PPM	ICPMS	0.5
DY PPM	ICPMS	0.5
ER PPM	ICPMS	0.5
LU PPM	ICPMS	0.1
HF PPM	ICPMS	1.
TA PPM	ICPMS	1.
W PPM	ICPMS	3.
PT PPB	FADCP	10.
TL PPM	ICPMS	1.
PB PPM	DCP	2.
BI PPM	ICPMS	0.5
TH PPM	ICPMS	1.
U PPM	ICPMS	0.5

X-RAY ASSAY LABORATORIES LIMITED

DATE 05-JAN-88

CERTIFIED BY .....

SAMPLE	AU PPB	LI PPM	BE PPM	B PPM	S PPM	V PPM	CR PPM	CO PPM	NI PPM
87-2-28	<1	40	<5	50	700	90	94	13	71
87-2-46	<1	50	<5	90	120	140	120	21	81
87-2-50	<1	40	5	90	60	170	120	25	90
87-2-76	<1	30	5	100	<20	120	110	42	90
87-2-96	<1	30	5	70	260	30	88	63	72
87-2-106	<1	20	10	70	40	20	60	73	57
87-2-116	<1	30	5	60	280	30	76	86	78
87-2-136	<1	40	5	60	900	20	56	100	67
87-2-146	12	30	5	70	680	10	68	78	77
87-2-156	17	20	<5	40	460	30	64	92	68
87-2-166	<1	40	<5	60	100	60	76	63	78
87-2-186	30	100	<5	70	2800	20	50	84	61
87-2-194	3	90	5	40	120	40	44	112	64
87-2-200	2	110	5	30	840	20	30	78	44
87-2-210	1	90	5	30	1900	10	32	74	42
87-2-220	3	80	5	50	1400	30	64	69	67
87-2-230	6	100	10	40	1900	20	42	128	53
87-2-240	14	100	10	20	380	20	28	111	42
87-2-260	30	20	5	90	8700	50	70	100	74
87-2-272	6	30	5	80	3300	90	92	107	88
87-2-282	5	30	10	30	3100	30	40	63	46
87-2-292	<1	50	10	30	340	20	20	96	46
87-2-306	6	<10	5	70	4900	40	52	63	46
87-2-324	2	70	5	20	2900	40	54	83	62
87-2-334	2	60	5	10	1600	20	32	80	54
87-2-344	<1	30	5	30	4300	40	40	97	58
87-2-356	<1	10	10	10	100	20	20	156	43
T1-1A	<1	40	<5	50	580	90	80	12	61
T1-1B	<1	40	<5	60	220	110	100	14	78
T1-1C	1	30	<5	70	280	110	110	17	89
T1-2A	<1	50	<5	70	60	130	120	18	100
T1-2B	<1	60	<5	60	160	110	120	15	89
T1-3A	2	50	<5	70	140	100	110	17	89
T1-3B	2	40	<5	60	240	90	94	15	75
T1-4	2	40	<5	70	100	110	120	20	96
T1-5	4	70	<5	80	<20	130	120	24	88
T1-6A	<1	50	5	80	180	140	110	21	85
T1-6B	15	20	<5	80	<20	90	110	44	110
T1-7	2	40	<5	80	20	30	120	48	92
T1-8	1	40	5	20	4700	20	24	82	57
T1-10	6	20	5	<10	600	20	18	139	32
T1-10A	1	50	5	<10	460	20	22	74	41
T1-11	<2	40	10	10	180	20	10	93	39
T1-12	<1	50	5	20	280	20	16	116	45
T2-1	<1	50	<5	60	60	100	96	17	87
T2-2	<1	40	<5	80	<20	220	100	24	86
T2-3	<1	30	5	50	<20	120	72	61	68
T2-4	<1	40	5	50	20	90	84	63	92
T2-6	2	10	5	30	120	60	56	67	67
T2-7	<1	30	5	40	20	90	60	83	82

SAMPLE	AU PPB	LI PPM	BE PPM	B PPM	S PPM	V PPM	CR PPM	CO PPM	NI PPM
T2-8	<1	50	5	60	560	120	78	78	95
T2-9	<1	70	5	80	<20	100	72	59	81
T2-10	7	30	5	60	200	60	64	79	72
T2-11	14	<10	10	30	580	50	20	113	37
T2-12	3	<10	10	140	260	60	28	121	44
T2-13	<1	20	10	50	840	120	40	94	70
T2-14	<1	30	5	40	2100	70	62	73	75
T2-15	<1	30	5	40	100	80	68	64	61
T2-16	7	40	10	40	3900	90	42	126	56
T2-17	2	20	10	30	1400	40	22	165	41
T2-18A	5	30	10	30	1800	50	30	106	42
T2-18B	<1	<10	10	180	880	30	20	107	33
T2-19	6	30	10	80	1200	100	58	107	74
T2-20	5	10	5	80	160	120	70	65	67
T2-21	<1	20	10	60	60	80	66	63	62
T2-22	7	30	10	40	260	80	80	103	77
T2-23	1	10	5	80	240	110	100	54	110
T2-24A	2	<10	5	80	260	310	92	64	83
T2-24B	<1	60	10	50	300	70	34	143	49
T2-25	2	80	10	70	340	60	24	126	38
T2-26	5	120	10	50	760	80	34	95	54
T2-27	4	60	10	20	2200	70	30	91	46
T2-28	6	10	10	30	3300	30	14	98	26
T2-29	6	<10	10	40	1100	40	20	132	39
T2-30	4	40	10	20	160	80	46	92	60
T2-31	15	<10	10	<10	660	70	24	134	46

SAMPLE	CU PPM	ZN PPM	GA PPM	GE PPM	AS PPM	SE PPM	MO PPM	PD PPB
87-2-28	27.0	74.0	10	<10	7	<3	<2	<2
87-2-46	74.0	110.	16	10	<1	<3	<2	<2
87-2-50	67.0	120.	17	<10	2	<3	<2	<2
87-2-76	30.0	110.	18	10	<1	<3	2	<2
87-2-96	73.0	86.0	17	<10	7	<3	5	<2
87-2-106	89.0	75.0	17	10	9	<3	10	3
87-2-116	64.0	94.0	17	<10	9	<3	7	3
87-2-136	42.0	76.0	17	<10	9	<3	10	3
87-2-146	10.0	76.0	17	<10	1	<3	10	4
87-2-156	19.0	83.0	15	<10	4	<3	7	2
87-2-166	200.	100.	18	<10	<1	<3	8	4
87-2-186	60.0	75.0	14	<10	3	<3	11	2
87-2-194	46.0	68.0	16	<10	3	<3	12	3
87-2-200	31.0	49.0	15	<10	9	<3	13	3
87-2-210	31.0	47.0	14	<10	9	<3	11	4
87-2-220	58.0	84.0	18	<10	5	<3	8	3
87-2-230	41.0	62.0	14	<10	5	<3	11	4
87-2-240	55.0	48.0	15	<10	3	<3	13	5
87-2-260	40.0	91.0	16	<10	5	<3	9	2
87-2-272	110.	110.	17	<10	8	<3	7	5
87-2-282	32.0	57.0	16	<10	5	<3	12	4
87-2-292	6.0	46.0	11	<10	9	<3	10	2
87-2-306	36.0	50.0	13	<10	5	<3	7	4
87-2-324	51.0	85.0	15	<10	6	<3	7	5
87-2-334	52.0	62.0	16	<10	9	<3	11	2
87-2-344	68.0	75.0	16	<10	9	<3	8	<2
87-2-356	63.0	49.0	14	<10	9	<3	13	<2
T1-1A	20.0	65.0	10	10	4	<3	<2	<2
T1-1B	27.0	80.0	11	10	9	<3	<2	<2
T1-1C	30.0	98.0	13	<10	9	<3	<2	2
T1-2A	34.0	130.	17	<10	9	<3	<2	<2
T1-2B	30.0	93.0	11	<10	9	<3	<2	<2
T1-3A	31.0	92.0	13	<10	9	<3	<2	<2
T1-3B	27.0	79.0	12	<10	9	<3	<2	<2
T1-4	37.0	120.	15	<10	9	<3	7	<2
T1-5	56.0	110.	16	<10	<1	<3	<2	<2
T1-6A	9.0	110.	15	<10	<1	<3	<2	<2
T1-6B	20.0	100.	20	<10	<1	<3	<2	<2
T1-7	24.0	70.0	17	<10	<1	<3	4	3
T1-8	88.0	58.0	14	<10	7	<3	10	3
T1-10	13.0	38.0	12	<10	13	<3	12	4
T1-10A	14.0	55.0	14	<10	7	<3	11	1
T1-11	13.0	48.0	13	<10	7	<3	12	<4
T1-12	4.5	44.0	13	<10	7	<3	11	2
T2-1	54.0	88.0	14	<10	7	<3	<2	<2
T2-2	33.0	110.	17	<10	<1	<3	<2	<2
T2-3	29.0	84.0	17	10	41	<3	6	4
T2-4	29.0	100.	18	10	26	<3	5	3
T2-6	27.0	75.0	16	<10	53	<3	8	2
T2-7	150.	95.0	17	10	53	<3	8	4

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SAMPLE	CU PPM	ZN PPM	GA PPM	GE PPM	AS PPM	SE PPM	MO PPM	PD PPB
T2-8	77.0	110.	19	10	26	<3	5	6
T2-9	58.0	90.0	18	10	90	<3	5	<2
T2-10	49.0	86.0	16	<10	150	<3	6	4
T2-11	31.0	51.0	13	10	180	<3	33	4
T2-12	11.0	52.0	16	10	200	<3	10	5
T2-13	79.0	79.0	16	10	140	<3	9	2
T2-14	29.0	78.0	16	10	35	<3	5	3
T2-15	13.0	78.0	17	10	31	<3	6	4
T2-16	40.0	70.0	15	<10	190	<3	10	5
T2-17	25.0	46.0	15	10	260	<3	12	3
T2-18A	34.0	57.0	13	<10	200	<3	12	3
T2-18B	19.0	39.0	16	20	300	<3	13	4
T2-19	100.	87.0	18	<10	180	<3	8	5
T2-20	76.0	88.0	17	<10	94	<3	6	3
T2-21	22.0	75.0	17	10	94	<3	7	<2
T2-22	6.5	81.0	19	10	28	<3	6	6
T2-23	130.	85.0	20	<10	94	<3	4	3
T2-24A	360.	87.0	20	<10	120	<3	5	4
T2-24B	32.0	56.0	17	10	260	<3	10	<2
T2-25	22.0	45.0	15	10	220	<3	9	4
T2-26	39.0	69.0	17	10	160	<3	10	6
T2-27	50.0	59.0	16	10	180	<3	10	5
T2-28	41.0	36.0	15	10	240	<3	17	4
T2-29	91.0	41.0	15	10	240	<3	11	7
T2-30	12.0	69.0	18	10	94	<3	9	3
T2-31	14.0	44.0	16	10	120	<3	11	<2

SAMPLE	AG PPM	CD PPM	IN PPM	SN PPM	SB PPM	CS PPM	LA PPM	CE PPM
87-2-28	<0.5	<1	<1	<10	0.3	3	28	53
87-2-46	<0.5	<1	<1	<10	0.2	5	33	66
87-2-50	<0.5	<1	<1	<10	0.4	7	38	79
87-2-76	<0.5	1	<1	<10	0.9	7	36	78
87-2-96	<0.5	<1	<1	<10	15.0	6	23	51
87-2-106	<0.5	1	<1	<10	4.0	4	23	68
87-2-116	<0.5	1	<1	<10	4.2	5	30	77
87-2-136	<0.5	1	<1	<10	13.0	5	26	67
87-2-146	<0.5	1	<1	<10	7.2	8	27	67
87-2-156	<0.5	2	<1	<10	5.8	4	25	64
87-2-166	<0.5	1	<1	<10	4.0	6	29	72
87-2-186	<0.5	1	<1	<10	3.7	5	23	62
87-2-194	<0.5	<1	<1	<10	0.9	6	23	63
87-2-200	<0.5	<1	<1	<10	1.2	3	25	66
87-2-210	<0.5	<1	<1	<10	1.4	3	23	66
87-2-220	<0.5	<1	<1	<10	2.2	6	27	67
87-2-230	<0.5	<1	<1	<10	2.2	6	30	81
87-2-240	<0.5	<1	<1	<10	4.0	3	28	84
87-2-260	<0.5	<1	<1	<10	4.0	6	29	80
87-2-272	<0.5	<1	<1	<10	1.6	6	39	110
87-2-282	<0.5	<1	<1	<10	4.0	3	24	71
87-2-292	<0.5	<1	<1	<10	3.9	2	<2	<1
87-2-306	<0.5	<1	<1	<10	2.8	4	22	63
87-2-324	<0.5	<1	<1	<10	2.2	4	29	71
87-2-334	<0.5	<1	<1	<10	1.2	2	31	79
87-2-344	<0.5	<1	<1	<10	2.2	13	29	75
87-2-356	<0.5	<1	<1	<10	3.6	11	24	66
T1-1A	<0.5	<1	<1	<10	0.3	3	22	43
T1-1B	<0.5	<1	<1	<10	0.7	3	27	53
T1-1C	<0.5	<1	<1	<10	1.0	3	28	55
T1-2A	<0.5	<1	<1	<10	0.7	4	38	73
T1-2B	<0.5	<1	<1	<10	0.6	4	32	65
T1-3A	<0.5	1	<1	<10	0.5	5	35	70
T1-3B	<0.5	<1	<1	<10	0.3	4	27	54
T1-4	<0.5	<1	<1	<10	0.5	4	33	64
T1-5	<0.5	<1	<1	<10	0.3	4	30	62
T1-6A	<0.5	<1	<1	<10	0.4	6	32	65
T1-6B	<0.5	<1	<1	<10	1.0	7	37	79
T1-7	<0.5	<1	<1	<10	28.0	6	22	45
T1-8	<0.5	<1	<1	<10	3.1	8	27	70
T1-10	<0.5	<1	<1	<10	0.8	7	26	85
T1-10A	<0.5	<1	<1	<10	0.8	<1	22	60
T1-11	<0.5	<1	<1	<10	5.5	3	20	57
T1-12	<0.5	<1	<1	<10	1.3	2	22	63
T2-1	<0.5	<1	<1	<10	0.3	2	31	60
T2-2	<0.5	<1	<1	<10	0.9	7	35	75
T2-3	<0.5	1	<1	<10	2.0	4	33	76
T2-4	<0.5	1	<1	<10	1.4	4	35	75
T2-6	<0.5	1	<1	<10	1.9	29	27	63
T2-7	<0.5	<1	<1	<10	1.0	25	30	76

SAMPLE	AG PPM	CD PPM	IN PPM	SN PPM	SB PPM	CS PPM	LA PPM	CE PPM
T2-8	<0.5	<1	<1	<10	0.8	17	35	87
T2-9	<0.5	<1	<1	<10	1.0	6	31	72
T2-10	<0.5	<1	<1	<10	17.0	5	27	64
T2-11	<0.5	<1	<1	<10	2.2	2	27	73
T2-12	<0.5	<1	<1	<10	3.4	10	28	77
T2-13	<0.5	1	<1	<10	2.0	14	32	84
T2-14	<0.5	2	<1	<10	0.6	5	29	69
T2-15	<0.5	<1	<1	<10	3.1	7	32	72
T2-16	<0.5	1	<1	<10	2.1	4	29	78
T2-17	<0.5	2	<1	<10	2.0	4	23	62
T2-18A	<0.5	1	<1	<10	1.0	2	26	70
T2-18B	<0.5	2	<1	<10	3.8	8	22	65
T2-19	<0.5	2	<1	<10	2.0	27	33	86
T2-20	<0.5	1	<1	<10	2.0	29	34	81
T2-21	<0.5	2	<1	<10	2.1	16	29	68
T2-22	<0.5	2	<1	<10	2.0	6	29	69
T2-23	<0.5	1	<1	<10	2.4	8	37	82
T2-24A	<0.5	<1	<1	<10	2.0	7	34	79
T2-24B	<0.5	2	<1	<10	1.8	5	31	82
T2-25	<0.5	3	<1	<10	2.0	9	28	78
T2-26	<0.5	2	<1	<10	0.9	4	30	83
T2-27	<0.5	2	<1	<10	2.0	3	29	80
T2-28	<0.5	3	<1	<10	1.4	2	19	56
T2-29	<0.5	2	<1	<10	2.3	3	24	67
T2-30	<0.5	2	<1	<10	5.0	3	29	73
T2-31	<0.5	1	<1	<10	5.2	3	31	81

SAMPLE	ND PPM	SM PPM	EU PPM	GD PPM	DY PPM	ER PPM	LU PPM	HF PPM
87-2-28	25.9	4.7	1.1	4.4	3.5	1.9	0.3	2
87-2-46	28.6	5.0	1.0	3.9	3.2	2.0	0.3	3
87-2-50	34.4	5.8	1.2	5.3	3.6	2.1	0.4	3
87-2-76	33.0	5.8	1.3	4.8	3.9	2.3	0.4	3
87-2-96	19.6	4.0	1.0	4.0	3.2	2.1	0.3	3
87-2-106	26.3	5.5	1.3	5.7	4.7	2.7	0.3	<1
87-2-116	31.7	5.9	1.4	5.6	4.5	2.6	0.3	2
87-2-136	27.2	5.3	1.8	5.3	4.4	2.3	0.3	<1
87-2-146	24.0	4.5	1.1	4.3	3.6	2.0	0.3	2
87-2-156	25.3	5.5	1.4	5.1	4.1	2.3	0.3	2
87-2-166	27.7	5.8	1.3	5.5	3.9	2.1	0.3	3
87-2-186	21.5	4.7	1.0	4.3	3.4	2.1	0.3	2
87-2-194	21.8	4.3	1.0	4.4	3.7	2.1	0.3	1
87-2-200	23.6	4.5	1.2	5.3	4.5	2.5	0.3	<1
87-2-210	23.1	4.7	1.2	5.8	5.0	2.6	0.3	1
87-2-220	25.6	5.1	1.2	5.4	4.5	2.3	0.3	2
87-2-230	29.5	6.1	1.4	7.0	5.8	2.8	0.4	1
87-2-240	28.0	6.1	1.6	6.5	5.4	2.9	0.4	1
87-2-260	30.6	6.6	1.5	6.6	5.5	3.2	0.6	2
87-2-272	36.2	7.7	1.7	7.1	5.2	3.2	0.5	3
87-2-282	23.4	4.5	1.3	5.1	4.4	2.0	0.3	1
87-2-292	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.1	<1
87-2-306	22.2	4.1	1.2	4.9	3.8	1.9	0.2	2
87-2-324	26.0	4.6	1.0	4.5	3.8	1.9	0.3	2
87-2-334	31.2	6.9	1.6	7.8	6.5	3.4	0.4	1
87-2-344	27.6	5.1	1.2	5.6	4.5	2.1	0.3	2
87-2-356	22.9	4.3	1.1	5.1	4.5	2.1	0.2	<1
T1-1A	21.4	3.5	0.8	3.0	2.6	1.3	0.2	2
T1-1B	26.7	4.0	0.9	3.5	3.4	1.6	0.3	2
T1-1C	27.6	4.7	1.0	4.3	3.6	2.1	0.2	3
T1-2A	34.8	5.6	1.2	5.1	4.2	2.5	0.4	3
T1-2B	30.4	5.1	1.1	4.5	4.2	2.1	0.3	3
T1-3A	32.8	5.9	1.2	4.9	4.0	2.0	0.3	3
T1-3B	26.8	4.5	1.0	4.0	3.8	1.8	0.3	3
T1-4	33.4	6.0	1.4	5.2	4.8	2.7	0.4	3
T1-5	27.9	4.4	1.0	3.3	3.0	1.9	0.3	3
T1-6A	28.6	5.0	1.0	4.1	3.1	1.8	0.3	3
T1-6B	34.5	5.6	1.2	4.0	3.1	1.5	0.3	3
T1-7	18.0	2.8	0.6	1.9	2.1	1.5	0.2	3
T1-8	25.7	4.8	1.2	5.8	4.7	2.4	0.3	1
T1-10	28.4	5.7	1.5	6.9	5.5	2.3	0.2	<1
T1-10A	19.8	4.1	1.1	4.7	4.4	2.0	0.3	<1
T1-11	19.3	3.7	1.1	5.0	4.2	2.1	0.2	<1
T1-12	21.7	4.2	1.0	5.0	4.3	2.1	0.2	<1
T2-1	30.3	5.2	1.2	3.9	3.5	2.0	0.2	3
T2-2	34.1	5.8	1.3	4.5	3.8	2.2	0.3	3
T2-3	30.0	5.3	1.2	5.1	3.6	2.1	0.3	3
T2-4	30.9	5.5	1.2	4.4	3.3	1.7	0.3	3
T2-6	25.7	4.8	1.1	5.1	4.1	2.1	0.2	2
T2-7	29.8	5.7	1.4	6.2	4.8	2.5	0.3	2

SAMPLE	ND PPM	SM PPM	EU PPM	GD PPM	DY PPM	ER PPM	LU PPM	HF PPM
T2-8	37.3	6.5	1.8	6.2	5.2	2.5	0.4	3
T2-9	28.6	5.2	1.3	4.7	3.8	2.1	0.3	3
T2-10	25.1	5.0	1.3	4.9	3.8	1.9	0.2	2
T2-11	26.4	5.5	1.2	6.1	5.2	2.6	0.3	1
T2-12	26.1	5.3	1.3	5.6	4.8	2.3	0.3	1
T2-13	32.8	6.7	1.7	7.3	6.1	3.2	0.3	2
T2-14	26.5	4.4	1.0	4.5	3.7	1.8	0.3	2
T2-15	29.5	4.9	1.2	4.4	3.5	2.2	0.2	3
T2-16	27.8	5.8	1.3	6.2	5.0	2.8	0.3	2
T2-17	23.0	3.9	1.1	4.7	4.1	2.1	0.2	<1
T2-18A	26.7	4.9	1.3	5.5	4.9	2.6	0.3	<1
T2-18B	21.8	4.3	1.2	5.2	4.3	2.1	0.2	<1
T2-19	32.9	6.2	1.4	6.7	6.0	3.1	0.4	2
T2-20	31.1	5.4	1.5	5.6	5.1	2.4	0.3	2
T2-21	26.3	4.3	1.2	4.0	3.2	1.9	0.3	2
T2-22	25.2	4.2	1.0	3.9	3.4	1.7	0.3	2
T2-23	32.5	4.9	1.3	4.1	2.8	1.5	0.3	3
T2-24A	32.9	5.3	1.3	4.4	3.7	1.9	0.3	3
T2-24B	29.6	5.2	1.3	5.8	4.5	2.3	0.3	2
T2-25	26.9	5.5	1.3	6.3	5.3	2.5	0.4	1
T2-26	30.9	5.8	1.5	6.9	5.6	2.7	0.3	1
T2-27	28.8	5.9	1.4	6.7	5.5	3.0	0.3	1
T2-28	18.3	3.2	1.0	4.3	3.7	1.7	0.2	<1
T2-29	21.7	4.2	1.3	5.2	4.2	2.2	0.2	<1
T2-30	25.7	4.5	1.2	5.1	4.4	2.2	0.3	2
T2-31	26.5	5.1	1.2	6.0	5.1	2.5	0.3	<1

SAMPLE	TA PPM	W PPM	PT PPB	TL PPM	PB PPM	BI PPM	TH PPM	U PPM
87-2-28	<1	<3	<10	<1	8	<0.5	4	1.4
87-2-46	1	<3	<10	<1	4	<0.5	7	1.8
87-2-50	1	<3	<10	<1	16	<0.5	8	2.1
87-2-76	1	<3	<10	<1	18	<0.5	7	2.1
87-2-96	1	3	<10	<1	16	<0.5	6	1.3
87-2-106	<1	4	<10	<1	12	<0.5	3	1.4
87-2-116	<1	<3	<10	<1	14	<0.5	5	1.5
87-2-136	<1	4	<10	<1	10	<0.5	4	1.3
87-2-146	<1	<3	<10	<1	16	<0.5	4	1.1
87-2-156	<1	5	<10	<1	12	<0.5	4	1.2
87-2-166	<1	<3	<10	<1	10	<0.5	5	2.3
87-2-186	<1	<3	<10	<1	16	<0.5	2	1.1
87-2-194	<1	<3	<10	<1	6	<0.5	2	1.1
87-2-200	<1	<3	<10	<1	<2	<0.5	<1	0.8
87-2-210	<1	6	<10	<1	2	<0.5	<1	0.7
87-2-220	<1	4	<10	<1	14	<0.5	4	1.3
87-2-230	<1	6	<10	<1	14	<0.5	2	1.7
87-2-240	<1	9	<10	<1	<2	<0.5	<1	0.8
87-2-260	<1	6	<10	<1	12	<0.5	3	2.0
87-2-272	<1	4	<10	<1	18	<0.5	5	2.4
87-2-282	<1	16	10	<1	8	<0.5	2	1.5
87-2-292	<1	15	<10	<1	<2	<0.5	<1	0.7
87-2-306	<1	5	<10	<1	4	<0.5	2	1.2
87-2-324	<1	<3	<10	<1	14	<0.5	4	1.9
87-2-334	<1	<3	<10	<1	12	<0.5	2	1.2
87-2-344	<1	3	<10	<1	14	<0.5	3	1.9
87-2-356	<1	9	<10	<1	4	<0.5	1	1.2
T1-1A	<1	<3	<10	<1	6	<0.5	3	1.2
T1-1B	<1	<3	<10	<1	8	<0.5	4	1.4
T1-1C	<1	<3	<10	<1	8	<0.5	5	1.6
T1-2A	<1	<3	<10	<1	14	<0.5	6	2.0
T1-2B	<1	<3	<10	<1	10	<0.5	3	1.4
T1-3A	<1	<3	<10	<1	10	<0.5	6	1.6
T1-3B	<1	<3	<10	<1	8	<0.5	4	1.5
T1-4	<1	<3	<10	<1	16	<0.5	6	1.9
T1-5	1	<3	<10	<1	12	<0.5	6	1.6
T1-6A	1	<3	<10	<1	12	<0.5	7	1.6
T1-6B	<1	<3	<10	<1	12	<0.5	7	1.5
T1-7	<1	<3	<10	<1	12	<0.5	7	1.2
T1-8	<1	<3	<10	<1	16	<0.5	1	1.0
T1-10	<1	<3	<10	<1	<2	<0.5	<1	0.7
T1-10A	<1	<3	<10	<1	4	<0.5	<1	0.9
T1-11	<1	<3	<20	<1	12	<0.5	<1	0.7
T1-12	<1	4	<10	<1	<2	<0.5	<1	0.7
T2-1	<1	<3	<10	<1	10	<0.5	5	1.3
T2-2	1	<3	<10	<1	10	<0.5	7	1.6
T2-3	<1	<3	10	<1	10	<0.5	5	1.7
T2-4	1	<3	10	<1	14	<0.5	6	1.5
T2-6	<1	<3	20	<1	14	<0.5	3	1.1
T2-7	<1	<3	10	<1	4	<0.5	4	1.4

SAMPLE	TA PPM	W PPM	PT PPB	TL PPM	PB PPM	BI PPM	TH PPM	U PPM
T2-8	<1	<3	20	<1	10	<0.5	6	2.1
T2-9	1	<3	<10	<1	8	<0.5	6	1.5
T2-10	<1	4	20	<1	10	<0.5	4	1.1
T2-11	<1	5	<10	<1	6	<0.5	1	1.0
T2-12	<1	<3	20	<1	2	<0.5	1	1.0
T2-13	<1	4	10	<1	16	<0.5	2	1.9
T2-14	<1	8	10	<1	16	<0.5	4	1.4
T2-15	1	3	10	<1	4	<0.5	5	1.6
T2-16	<1	5	10	<1	14	<0.5	2	1.7
T2-17	<1	<3	10	<1	<2	<0.5	<1	0.8
T2-18A	<1	3	10	<1	<2	<0.5	2	1.0
T2-18B	<1	6	20	<1	2	<0.5	<1	0.6
T2-19	<1	5	<10	<1	6	<0.5	4	2.0
T2-20	<1	<3	<10	<1	130	<0.5	4	1.5
T2-21	<1	4	<10	<1	10	<0.5	3	1.3
T2-22	1	9	<10	<1	4	<0.5	5	1.7
T2-23	<1	4	<10	<1	8	<0.5	6	1.7
T2-24A	1	4	<10	<1	<2	<0.5	6	2.1
T2-24B	<1	<3	<10	<1	16	<0.5	3	1.8
T2-25	<1	<3	<10	<1	<2	<0.5	1	1.1
T2-26	<1	3	<10	<1	4	<0.5	2	1.6
T2-27	<1	<3	<10	<1	10	<0.5	2	1.5
T2-28	<1	<3	<10	<1	<2	<0.5	<1	<0.5
T2-29	<1	5	10	<1	4	<0.5	<1	0.6
T2-30	<1	6	<10	<1	12	<0.5	3	1.1
T2-31	<1	15	<10	<1	4	<0.5	1	1.0

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	LOI	SUM
87-2-28	38.8	11.8	19.6	3.38	0.76	2.35	5.03	0.12	0.50	0.10	17.7	100.3
87-2-46	60.0	17.5	0.67	4.12	1.10	3.64	7.71	0.19	0.74	0.05	4.23	100.1
87-2-50	58.2	18.3	0.23	4.08	0.85	4.74	8.19	0.66	0.78	0.07	4.23	100.5
87-2-76	54.0	17.8	0.30	3.68	1.29	4.55	8.63	3.51	0.75	0.08	4.85	99.6
87-2-96	44.7	14.7	1.04	2.91	1.94	3.12	14.2	8.12	0.60	0.43	6.46	98.5
87-2-106	31.3	9.95	2.68	2.53	0.99	1.96	29.0	14.5	0.43	1.34	5.31	100.1
87-2-116	40.2	12.7	1.68	2.62	1.74	2.65	19.9	10.3	0.54	0.68	5.16	98.5
87-2-136	32.7	10.4	3.32	2.15	2.44	1.68	20.5	14.5	0.45	0.87	9.24	98.9
87-2-146	29.9	11.5	4.57	2.15	1.88	1.87	17.9	14.7	0.50	0.63	12.5	98.5
87-2-156	36.6	11.4	4.66	2.56	2.15	2.00	17.3	10.6	0.49	0.80	10.9	99.8
87-2-166	43.0	13.6	1.32	2.85	0.68	3.61	14.3	8.95	0.57	0.45	9.70	99.2
87-2-186	31.4	8.86	1.54	4.57	0.17	2.03	16.0	14.0	0.42	0.69	20.2	100.0
87-2-194	25.4	7.66	2.70	4.33	0.09	0.83	19.0	19.4	0.37	1.19	19.2	100.2
87-2-200	22.0	5.68	2.72	2.64	0.01	0.61	26.3	17.4	0.27	1.20	21.1	100.0
87-2-210	20.5	5.12	3.25	2.05	0.09	0.63	28.8	16.3	0.24	1.56	21.7	100.3
87-2-220	32.9	11.7	1.73	2.72	1.64	1.66	19.1	12.5	0.51	0.68	14.7	100.0
87-2-230	24.3	7.66	2.38	1.86	0.51	1.29	26.4	15.8	0.35	1.12	18.2	100.0
87-2-240	15.8	5.45	3.86	1.51	0.25	0.60	31.5	20.4	0.26	1.66	18.3	99.7
87-2-260	34.2	10.7	3.58	2.04	0.07	3.06	19.2	11.6	0.46	0.88	12.9	98.9
87-2-272	41.9	14.0	1.64	2.58	0.13	4.00	15.9	6.80	0.62	0.59	11.6	99.9
87-2-282	23.6	7.57	3.09	1.48	<0.01	1.53	28.7	18.0	0.33	1.53	14.2	100.1
87-2-292	15.9	4.38	4.52	1.10	0.06	0.73	38.9	16.5	0.21	1.74	16.1	100.3
87-2-306	34.6	9.11	2.66	1.77	0.23	2.44	21.6	11.1	0.38	1.09	15.1	100.2
87-2-324	34.6	11.6	1.42	4.83	0.49	0.55	22.5	11.1	0.51	0.56	12.0	100.2
87-2-334	29.4	7.68	3.19	3.91	0.18	0.28	19.3	19.1	0.32	1.38	15.5	100.3
87-2-344	33.7	9.77	1.94	3.35	0.35	1.12	23.0	13.5	0.41	0.91	12.1	100.3
87-2-356	17.3	5.52	3.26	1.67	0.31	0.42	32.7	22.7	0.25	1.41	14.5	100.2
T1-1A	36.9	10.2	21.9	2.40	0.79	2.24	4.55	0.14	0.46	0.08	20.3	100.1
T1-1B	45.4	12.5	15.0	3.12	0.95	2.60	5.50	0.13	0.58	0.10	14.1	100.1
T1-1C	50.0	14.8	9.15	3.81	0.89	3.14	6.64	0.11	0.68	0.11	10.6	100.1
T1-2A	55.1	17.3	3.04	4.97	1.07	3.57	7.39	0.15	0.82	0.12	6.47	100.1
T1-2B	53.3	15.5	6.01	4.62	1.07	3.10	6.64	0.14	0.74	0.11	8.39	99.7
T1-3A	54.1	15.3	5.92	4.46	1.19	3.06	6.70	0.14	0.75	0.12	8.23	100.1
T1-3B	42.7	12.8	15.9	3.62	0.79	2.65	5.51	0.11	0.57	0.10	15.2	100.1
T1-4	55.2	16.6	4.35	4.31	1.42	3.11	6.99	0.38	0.78	0.11	7.08	100.4
T1-5	59.3	18.0	0.09	4.16	0.99	3.79	8.01	0.29	0.75	0.05	4.47	100.0
T1-6A	59.1	17.8	0.07	4.04	0.91	4.59	8.42	0.25	0.77	0.05	3.93	100.1
T1-6B	55.8	18.3	0.19	3.24	1.49	4.76	8.13	2.09	0.76	0.07	4.47	99.5
T1-7	52.3	18.3	0.41	1.13	2.63	4.35	9.32	5.41	0.83	0.06	4.39	99.3
T1-8	27.5	6.08	2.52	2.71	0.06	0.37	26.8	17.1	0.24	1.30	15.4	100.1
T1-10	24.3	3.76	3.03	1.13	0.05	0.24	28.7	19.0	0.19	1.74	17.5	99.8
T1-10A	28.7	6.02	2.26	2.01	<0.01	0.19	26.2	17.8	0.23	1.21	15.5	100.2
T1-11	18.2	3.48	3.58	0.95	0.02	0.39	37.2	19.7	0.13	1.99	14.5	100.2
T1-12	22.2	4.32	2.87	0.95	0.21	0.44	31.6	18.5	0.17	1.41	17.5	100.3
T2-1	48.6	14.1	10.9	4.26	0.90	2.68	5.96	0.40	0.63	0.10	11.5	100.1
T2-2	57.6	18.3	0.17	3.69	0.89	5.02	7.92	1.12	0.80	0.07	4.39	100.1
T2-3	41.4	13.4	1.54	2.62	0.57	3.68	18.9	9.21	0.60	0.70	7.16	100.0
T2-4	47.0	15.3	0.81	3.27	1.76	3.50	12.0	7.72	0.66	0.28	6.00	98.5
T2-6	35.7	10.3	3.62	2.19	1.51	1.67	20.9	13.1	0.45	0.85	9.47	99.9
T2-7	35.5	11.5	2.06	2.40	1.57	2.03	22.4	12.8	0.49	0.98	8.16	100.0

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

XRAL

XRF - WHOLE ROCK ANALYSIS 05-JAN-88 REPORT 3319 REFERENCE FILE 30584

SAMPLE \ %	SIO2	AL203	CAO	MGO	NA2O	K2O	FE203	MNO	TIO2	P2O5	LOI	SUM
T2-8	47.0	16.1	1.01	3.00	3.80	2.71	10.9	8.22	0.68	0.36	4.39	98.8
T2-9	46.5	14.9	0.91	2.94	1.09	4.02	16.3	7.69	0.63	0.51	3.47	99.1
T2-10	36.8	11.5	1.97	2.96	1.25	2.50	20.8	11.8	0.50	0.93	9.31	100.6
T2-11	19.5	5.65	3.33	1.48	0.35	0.85	30.6	17.8	0.25	1.51	18.8	100.3
T2-12	22.0	6.86	3.47	1.33	0.71	0.63	31.5	19.4	0.32	1.51	12.2	100.1
T2-13	28.1	8.88	2.53	1.76	0.96	1.34	28.6	14.7	0.38	1.24	11.5	100.1
T2-14	36.3	12.7	1.60	2.35	2.27	2.13	20.3	10.3	0.55	0.69	10.4	99.7
T2-15	40.1	13.1	1.21	2.65	1.55	3.16	16.4	10.8	0.55	0.55	9.00	99.3
T2-16	26.5	8.46	2.56	1.86	0.36	1.62	27.3	14.0	0.37	1.26	17.6	100.0
T2-17	17.8	4.88	3.29	1.62	0.08	0.84	28.0	20.3	0.22	1.16	21.8	100.1
T2-18A	22.6	6.41	2.57	2.05	0.42	1.04	28.3	14.9	0.31	1.11	20.0	99.8
T2-18B	16.7	3.78	4.92	0.92	<0.01	0.09	31.3	24.4	0.17	1.72	15.9	100.0
T2-19	32.8	11.2	2.70	2.02	1.04	1.89	25.2	13.1	0.49	1.20	8.47	100.3
T2-20	38.9	12.2	2.45	2.42	2.71	1.82	21.4	9.84	0.52	0.83	6.31	99.7
T2-21	34.3	11.1	1.71	2.00	0.94	3.14	24.8	12.0	0.49	0.79	8.77	100.3
T2-22	36.1	13.9	1.24	2.37	0.84	3.99	19.0	11.1	0.60	0.66	10.2	100.2
T2-23	48.1	17.7	0.34	1.86	1.51	5.21	8.19	6.77	0.75	0.07	8.77	99.5
T2-24A	45.6	16.6	0.70	1.46	0.59	5.03	13.3	6.23	0.68	0.38	9.08	99.8
T2-24B	26.2	8.41	2.23	2.04	0.38	0.83	25.4	17.5	0.39	1.11	15.3	99.9
T2-25	19.3	5.54	3.15	1.54	0.10	0.71	32.6	16.2	0.27	1.78	18.9	100.2
T2-26	23.4	7.82	2.37	3.10	0.03	1.01	25.3	17.7	0.34	1.28	17.9	100.3
T2-27	28.0	7.87	2.43	3.60	0.19	0.52	25.4	15.5	0.33	1.15	15.2	100.3
T2-28	20.0	3.83	3.20	0.99	0.02	0.80	30.2	21.0	0.13	1.46	18.6	100.3
T2-29	20.3	4.02	3.36	1.14	0.16	0.55	30.5	19.7	0.19	1.40	18.6	100.0
T2-30	31.1	8.93	2.25	1.84	1.74	1.61	22.9	15.8	0.39	0.90	12.3	100.0
T2-31	22.0	5.88	2.83	1.64	0.98	1.13	30.9	18.3	0.26	1.33	14.8	100.2

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ PPM	RB	SR	Y	ZR	NB	BA
87-2-28	94	752	19	68	20	240
87-2-46	164	68	13	13	34	960
87-2-50	208	23	29	155	27	957
87-2-76	175	66	11	116	24	1400
87-2-96	<10	324	<10	72	21	2440
87-2-106	<10	121	<10	44	19	899
87-2-116	<10	211	<10	75	30	2200
87-2-136	<10	399	<10	28	14	5540
87-2-146	<10	307	<10	67	<10	3300
87-2-156	<10	245	<10	58	24	2420
87-2-166	<10	142	<10	100	30	1010
87-2-186	<10	182	<10	50	<10	613
87-2-194	<10	180	<10	31	19	350
87-2-200	<10	157	<10	12	27	444
87-2-210	<10	163	<10	13	41	348
87-2-220	<10	174	<10	63	18	898
87-2-230	<10	199	<10	45	27	1070
87-2-240	<10	216	<10	23	29	1000
87-2-260	<10	280	<10	66	18	1150
87-2-272	<10	132	<10	84	13	1350
87-2-282	<10	116	<10	20	24	891
87-2-292	<10	245	<10	<10	<10	1600
87-2-306	<10	233	<10	34	35	1160
87-2-324	10	135	<10	62	19	392
87-2-334	<10	182	<10	21	24	230
87-2-344	18	361	17	61	25	695
87-2-356	<10	417	19	<10	17	580
T1-1A	99	807	12	58	<10	205
T1-1B	103	574	22	111	18	274
T1-1C	132	377	15	122	19	383
T1-2A	146	147	27	171	27	551
T1-2B	128	265	27	138	33	424
T1-3A	138	261	29	158	20	418
T1-3B	115	638	<10	88	19	286
T1-4	129	169	24	154	23	438
T1-5	158	<10	27	147	29	706
T1-6A	198	13	27	120	20	759
T1-6B	188	59	16	132	22	1350
T1-7	164	147	12	129	<10	1350
T1-8	<10	107	<10	20	27	345
T1-10	<10	292	<10	<10	16	1400
T1-10A	<10	195	<10	<10	15	190
T1-11	<10	166	<10	<10	14	645
T1-12	<10	193	<10	<10	21	901
T2-1	102	341	18	109	<10	410
T2-2	211	36	21	151	17	1120
T2-3	124	64	15	84	23	1330
T2-4	<10	55	<10	122	24	1510
T2-6	<10	199	<10	44	19	1130
T2-7	84	148	<10	67	<10	838

SAMPLE \ PPM	RB	SR	Y	ZR	NB	BA
T2-8	94	572	32	91	14	4490
T2-9	143	50	<10	101	31	1290
T2-10	84	180	22	72	31	1880
T2-11	<10	226	<10	18	18	1010
T2-12	<10	269	<10	31	32	1550
T2-13	<10	168	11	47	31	1090
T2-14	<10	156	<10	83	15	1060
T2-15	<10	150	<10	79	18	1590
T2-16	63	190	<10	57	12	559
T2-17	<10	109	<10	15	26	550
T2-18A	41	171	15	21	12	497
T2-18B	<10	248	<10	<10	16	465
T2-19	75	319	17	58	17	1240
T2-20	92	397	<10	79	22	1920
T2-21	<10	103	<10	51	32	1910
T2-22	154	124	<10	73	27	1510
T2-23	184	148	<10	110	20	1180
T2-24A	154	143	15	99	28	1210
T2-24B	<10	123	<10	56	29	380
T2-25	<10	210	10	<10	<10	306
T2-26	<10	200	16	47	14	384
T2-27	28	180	11	40	23	240
T2-28	<10	189	<10	<10	11	396
T2-29	<10	191	<10	<10	20	322
T2-30	56	164	31	44	27	1450
T2-31	57	200	11	13	36	815

XRAL

CERTIFICATE OF ANALYSIS

REPORT 3782

TO: MARITIME RESOURCE RESEARCH LIMITED
ATTN: G. CHRISTOPHER ROBERTS
301 WOODSTOCK ROAD
FREDERICTON, NEW BRUNSWICK
E3B 2H9

CUSTOMER No. 1417

DATE SUBMITTED
15-Dec-87

REF. FILE 30787-U1

Total Pages 7

36 CR.ROCKS

	METHOD	DETECTION LIMIT
AU PPB	FADCP	1.
LI PPM	AA	10.
BE PPM	DCP	5.
B PPM	DCP	10.
URNAJ %	UR	0.01
S PPM	XRF	100.
V PPM	DCP	10.
CR PPM	DCP	2.
CO PPM	ICPMS	1.
NI PPM	DCP	1.
CU PPM	DCP	0.5
ZN PPM	DCP	0.5
GA PPM	ICPMS	1.
GE PPM	DCP	10.
AS PPM	FAA	1.
SE PPM	GFAA	3.
URMIN PPM	UR	10.
MO PPM	ICPMS	2.
PD PPB	FADCP	2.
AG PPM	DCP	0.5
CD PPM	DCP	1.
IN PPM	ICPMS	1.

	METHOD	DETECTION LIMIT
SN PPM	XRF	10.
SB PPM	FAA	0.2
CS PPM	ICPMS	1.
LA PPM	ICPMS	2.
CE PPM	ICPMS	1.
ND PPM	ICPMS	0.5
SM PPM	ICPMS	0.5
EU PPM	ICPMS	0.1
GD PPM	ICPMS	0.5
DY PPM	ICPMS	0.5
ER PPM	ICPMS	0.5
LU PPM	ICPMS	0.1
HF PPM	ICPMS	1.
TA PPM	ICPMS	1.
W PPM	ICPMS	3.
PT PPB	FADCP	10.
TL PPM	ICPMS	1.
PB PPM	DCP	2.
BI PPM	ICPMS	0.5
TH PPM	ICPMS	1.
U PPM	ICPMS	0.5

X-RAY ASSAY LABORATORIES LIMITED

DATE 09-FEB-88

CERTIFIED BY .....

*** UNLESS INSTRUCTED OTHERWISE WE WILL DISCARD PULPS 180 DAYS ***
AND REJECTS 30 DAYS FROM DATE OF THIS REPORT

XRAL

09-FEB-88 REPORT 3782 REF.FILE 30787-U1 PAGE 1 OF 7

SAMPLE	AU PPB	LI PPM	BE PPM	B PPM	S PPM	V PPM	CR PPM	CO PPM	NI PPM
87-3-20	2	60	5	80	1100	30	51	99	59
87-3-32	3	140	5	70	1800	30	68	94	70
87-3-42	2	60	5	50	540	50	94	77	87
87-3-62	3	80	5	50	2000	50	82	105	83
87-3-82	2	50	5	30	520	20	26	204	44
87-3-92	<1	20	5	30	380	10	24	173	33
87-3-102	<1	30	10	60	780	10	34	152	49
87-3-112	<1	50	5	60	2300	60	80	99	78
87-3-127	3	40	10	50	1100	30	36	126	45
87-3-142	20	20	5	90	7100	40	60	104	66
87-3-152	5	40	5	40	5200	20	30	156	42
87-3-169	<1	20	10	60	60	<10	20	258	41
87-3-174	6	40	10	60	100	30	41	135	43
87-3-182	8	30	10	120	320	20	34	187	44
87-3-192	3	50	10	50	360	20	26	146	32
87-3-212	<1	30	10	40	380	20	34	176	41
87-3-232	2	30	5	60	380	20	30	189	43
87-3-242	25	70	5	60	1300	30	54	112	61
87-3-262	5	100	<5	70	820	30	38	129	59
87-3-282	10	280	5	90	2600	100	60	90	63
87-3-292	2	100	5	60	2700	70	34	125	54
87-3-312	7	90	5	40	6000	90	52	127	63
87-3-336	4	140	5	90	3800	50	34	125	47
87-3-346	6	170	5	70	5600	80	38	114	52
87-3-362	1	60	5	80	3600	130	92	63	69
87-3-382	1	60	5	80	6800	160	110	93	83
87-3-392	<1	70	5	90	4200	170	110	60	82
87-3-412	<1	60	5	80	760	150	96	38	70
87-3-422	<1	50	5	80	9300	170	110	59	82
87-3-432	2	60	5	90	3900	150	96	37	70
87-3-462	3	50	<5	100	1800	170	94	47	71
87-3-492	<1	60	<5	80	4400	160	96	48	69
87-3-532	<1	60	5	90	3100	170	94	43	63
87-3-562	<1	60	5	80	1500	160	86	42	59
87-3-592	8	70	5	90	1400	150	100	46	72
87-3-622	4	50	<5	50	20	90	100	24	69

SAMPLE	CU PPM	ZN PPM	GA PPM	GE PPM	AS PPM	SE PPM	MO PPM	PD PPB
87-3-20	50.0	58.0	19	<10	9	<3	6	2
87-3-32	30.0	74.0	24	<10	8	<3	19	<2
87-3-42	81.0	110.	27	<10	1	<3	4	2
87-3-62	54.0	96.0	28	<10	10	<3	5	<2
87-3-82	30.0	51.0	27	<10	12	<3	9	2
87-3-92	20.0	40.0	29	<10	8	<3	10	2
87-3-102	14.0	55.0	28	<10	9	<3	9	3
87-3-112	37.0	99.0	30	<10	5	<3	7	3
87-3-127	11.0	54.0	25	<10	9	<3	14	6
87-3-142	63.0	75.0	20	<10	9	<3	7	2
87-3-152	42.0	55.0	24	<10	9	<3	18	3
87-3-169	5.5	43.0	31	10	9	<3	12	2
87-3-174	63.0	55.0	22	<10	9	<3	7	2
87-3-182	88.0	48.0	30	10	9	<3	9	2
87-3-192	29.0	50.0	27	<10	8	<3	9	2
87-3-212	12.0	47.0	29	10	11	<3	9	2
87-3-232	22.0	50.0	31	10	8	<3	9	2
87-3-242	38.0	73.0	29	10	9	<3	7	<2
87-3-262	41.0	64.0	26	<10	4	<3	8	<2
87-3-282	64.0	86.0	24	<10	10	<3	4	2
87-3-292	50.0	63.0	27	10	6	<3	14	2
87-3-312	71.0	78.0	25	10	6	<3	8	4
87-3-336	83.0	67.0	25	<10	8	<3	8	2
87-3-346	66.0	66.0	27	10	8	<3	29	3
87-3-362	91.0	110.	23	<10	28	<3	<2	3
87-3-382	110.	130.	25	<10	46	<3	<2	3
87-3-392	69.0	130.	22	<10	33	<3	<2	2
87-3-412	65.0	130.	24	<10	3	<3	<2	<2
87-3-422	86.0	140.	24	<10	23	<3	3	3
87-3-432	83.0	120.	26	<10	10	<3	4	2
87-3-462	83.0	120.	25	<10	27	<3	<2	3
87-3-492	79.0	120.	26	<10	28	<3	<2	4
87-3-532	79.0	120.	26	<10	16	<3	2	<2
87-3-562	87.0	120.	26	<10	12	<3	<2	4
87-3-592	77.0	130.	26	<10	14	<3	<2	3
87-3-622	18.0	80.0	18	<10	2	<3	<2	<2

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SAMPLE	AG PPM	CD PPM	IN PPM	SN PPM	SB PPM	CS PPM	LA PPM	CE PPM
87-3-20	<0.5	2	<1	<10	2.1	5	26	70
87-3-32	<0.5	1	<1	<10	2.5	7	27	69
87-3-42	<0.5	1	<1	<10	1.0	8	36	86
87-3-62	<0.5	1	<1	<10	1.0	5	30	73
87-3-82	<0.5	1	<1	<10	1.0	3	22	60
87-3-92	<0.5	2	<1	<10	2.5	2	24	70
87-3-102	<0.5	2	<1	<10	4.3	13	26	75
87-3-112	<0.5	2	<1	<10	2.5	10	34	88
87-3-127	<0.5	2	<1	<10	3.0	4	27	77
87-3-142	<0.5	1	<1	<10	4.3	5	23	60
87-3-152	<0.5	1	<1	<10	1.0	4	18	52
87-3-169	<0.5	2	<1	<10	6.7	5	21	60
87-3-174	<0.5	2	<1	<10	4.2	6	33	91
87-3-182	<0.5	1	<1	<10	5.1	6	25	73
87-3-192	<0.5	1	<1	<10	4.3	3	21	57
87-3-212	<0.5	1	<1	<10	4.3	4	26	75
87-3-232	<0.5	1	<1	<10	4.0	5	25	73
87-3-242	<0.5	1	<1	<10	1.0	4	28	73
87-3-262	<0.5	1	<1	<10	0.8	3	22	59
87-3-282	<0.5	<1	<1	<10	2.4	7	31	78
87-3-292	<0.5	1	<1	<10	1.1	5	21	59
87-3-312	<0.5	1	<1	<10	4.0	3	27	70
87-3-336	<0.5	1	<1	<10	2.1	4	20	52
87-3-346	<0.5	<1	<1	<10	4.0	4	28	69
87-3-362	<0.5	<1	<1	<10	2.4	7	36	84
87-3-382	<0.5	1	<1	<10	3.2	7	37	82
87-3-392	<0.5	<1	<1	<10	2.1	8	40	88
87-3-412	<0.5	1	<1	<10	0.5	9	38	82
87-3-422	<0.5	1	<1	<10	2.1	9	36	82
87-3-432	<0.5	1	<1	<10	1.1	8	41	92
87-3-462	<0.5	<1	<1	<10	0.8	10	41	93
87-3-492	<0.5	<1	<1	<10	1.1	9	38	86
87-3-532	<0.5	<1	<1	<10	1.9	9	42	96
87-3-562	<0.5	<1	<1	<10	0.8	8	38	87
87-3-592	<0.5	1	<1	<10	0.9	8	39	85
87-3-622	<0.5	<1	<1	<10	0.2	4	33	64

SAMPLE	ND PPM	SM PPM	EU PPM	GD PPM	DY PPM	ER PPM	LU PPM	HF PPM
87-3-20	26.4	6.4	1.4	5.5	5.0	2.4	0.3	2
87-3-32	25.3	4.8	1.0	5.1	3.8	2.0	0.3	2
87-3-42	33.5	7.0	1.2	5.2	4.2	2.0	0.4	3
87-3-62	29.7	5.1	1.2	5.3	4.2	2.0	0.4	3
87-3-82	20.6	3.8	1.1	4.8	4.2	2.2	0.3	1
87-3-92	22.8	4.8	1.3	5.9	4.2	2.0	0.3	<1
87-3-102	25.5	5.5	1.2	5.9	4.9	2.6	0.4	1
87-3-112	33.1	6.3	1.4	6.6	4.9	2.7	0.3	3
87-3-127	27.7	5.6	1.1	6.3	4.7	2.3	0.3	1
87-3-142	23.0	5.0	1.0	5.1	3.2	2.1	0.2	2
87-3-152	20.2	3.8	1.0	4.1	3.5	1.6	0.2	1
87-3-169	19.8	4.1	1.0	4.7	3.4	1.7	0.2	<1
87-3-174	32.4	6.4	1.5	6.5	6.1	2.7	0.4	1
87-3-182	26.0	5.1	1.3	5.6	4.4	2.3	0.4	1
87-3-192	20.5	4.0	1.0	5.0	3.8	2.3	0.3	<1
87-3-212	26.1	4.7	1.3	4.7	4.3	2.1	0.4	1
87-3-232	24.7	4.9	1.2	5.1	4.6	2.3	0.4	1
87-3-242	26.8	4.9	1.2	5.2	4.4	2.1	0.3	2
87-3-262	23.4	4.2	1.1	4.4	4.4	1.8	0.3	2
87-3-282	32.7	6.5	1.7	7.2	5.2	2.5	0.3	2
87-3-292	23.1	5.5	1.2	4.7	4.6	1.7	0.3	1
87-3-312	27.2	5.1	1.2	5.3	4.3	2.0	0.4	2
87-3-336	20.0	4.0	1.2	4.7	3.5	2.1	0.3	1
87-3-346	28.0	5.8	1.5	5.9	4.5	2.2	0.4	2
87-3-362	36.3	5.8	1.6	5.4	4.2	2.0	0.4	3
87-3-382	38.2	6.3	1.4	4.6	3.7	1.8	0.4	3
87-3-392	37.5	6.2	1.4	5.3	3.7	2.0	0.5	3
87-3-412	35.4	5.7	1.3	4.6	3.4	1.5	0.4	4
87-3-422	34.5	5.8	1.2	5.2	4.4	2.1	0.4	3
87-3-432	40.4	7.2	1.9	6.1	5.2	2.5	0.4	3
87-3-462	39.9	7.2	1.4	5.2	4.3	2.1	0.5	4
87-3-492	36.8	5.5	1.5	5.3	4.0	2.0	0.4	4
87-3-532	38.2	7.1	1.5	5.1	4.1	2.1	0.5	4
87-3-562	37.8	6.5	1.8	5.6	4.3	2.0	0.4	3
87-3-592	37.9	6.6	1.7	5.7	4.0	2.2	0.4	4
87-3-622	29.7	4.8	1.5	4.4	3.8	1.7	0.4	3

XRAL

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SAMPLE	TA PPM	W PPM	PT PPB	TL PPM	PB PPM	BI PPM	TH PPM	U PPM
87-3-20	<1	4	<10	<1	<2	0.6	5	1.2
87-3-32	<1	5	<10	<1	16	6.4	7	1.8
87-3-42	<1	4	<10	<1	20	0.5	11	2.1
87-3-62	<1	4	<10	<1	26	3.7	8	1.9
87-3-82	<1	<3	10	<1	8	<0.5	3	1.0
87-3-92	<1	8	10	<1	<2	<0.5	3	0.7
87-3-102	<1	6	10	<1	14	<0.5	3	0.9
87-3-112	<1	6	<10	<1	10	0.6	9	2.0
87-3-127	<1	7	10	<1	2	0.6	3	1.1
87-3-142	<1	6	10	<1	10	<0.5	6	1.5
87-3-152	<1	3	10	<1	10	0.5	3	1.0
87-3-169	<1	6	10	<1	<2	<0.5	2	0.8
87-3-174	<1	11	10	<1	2	<0.5	4	1.6
87-3-182	<1	10	10	<1	4	<0.5	4	0.9
87-3-192	<1	8	10	<1	<2	<0.5	2	0.8
87-3-212	<1	8	<10	<1	<2	<0.5	3	0.9
87-3-232	<1	8	<10	<1	6	<0.5	3	1.0
87-3-242	<1	6	<10	<1	2	<0.5	6	1.2
87-3-262	<1	9	10	<1	12	<0.5	5	1.3
87-3-282	<1	<3	<10	<1	10	<0.5	7	2.0
87-3-292	<1	<3	<10	<1	12	<0.5	4	1.3
87-3-312	<1	<3	<10	<1	18	<0.5	6	2.2
87-3-336	<1	3	10	<1	18	0.6	4	1.4
87-3-346	<1	<3	<10	<1	12	<0.5	4	1.7
87-3-362	1	<3	<10	<1	24	0.6	12	3.0
87-3-382	<1	<3	<10	<1	44	0.5	11	3.6
87-3-392	1	<3	<10	1	30	<0.5	12	3.2
87-3-412	1	<3	10	<1	18	1.0	12	2.2
87-3-422	<1	<3	<10	1	28	<0.5	11	3.7
87-3-432	<1	<3	<10	<1	12	<0.5	12	3.3
87-3-462	1	<3	<10	<1	22	0.8	14	3.3
87-3-492	1	<3	<10	<1	18	0.6	12	3.0
87-3-532	1	<3	<10	<1	20	0.7	13	2.7
87-3-562	1	<3	<10	<1	20	0.5	13	2.5
87-3-592	1	<3	<10	<1	16	0.5	12	2.4
87-3-622	<1	<3	<10	<1	10	<0.5	9	1.6

SAMPLE \ %	SIO2	AL203	CAO	MGO	NA2O	K2O	FE203	MNO	TIO2	P2O5	LOI	SUM
87-3-20	24.3	7.55	2.39	2.69	0.24	2.15	23.3	14.8	0.34	1.18	21.2	100.2
87-3-32	30.7	10.6	2.07	2.96	1.34	1.71	19.4	14.2	0.48	0.81	15.5	99.9
87-3-42	45.8	15.0	0.99	2.68	3.22	1.92	12.2	8.36	0.61	0.29	7.70	98.9
87-3-62	38.8	12.5	1.39	2.54	2.03	1.63	17.2	11.1	0.55	0.49	11.3	99.7
87-3-82	22.9	5.42	2.63	1.64	0.41	0.65	26.4	18.5	0.22	1.10	20.2	100.1
87-3-92	12.9	3.87	4.04	1.30	0.22	0.48	31.5	22.2	0.20	1.65	21.3	99.7
87-3-102	21.7	5.21	4.58	1.15	0.44	0.52	32.1	19.7	0.23	1.61	12.5	100.0
87-3-112	39.8	12.7	1.70	2.40	1.66	2.35	19.6	9.38	0.56	0.79	7.16	98.4
87-3-127	21.2	5.92	3.74	1.17	0.50	1.36	32.6	14.9	0.26	1.69	16.9	100.3
87-3-142	31.8	9.30	2.13	1.92	0.35	2.67	20.0	13.2	0.41	0.85	17.3	100.1
87-3-152	25.6	5.63	2.46	1.68	0.58	0.94	24.7	17.8	0.22	1.04	19.5	100.3
87-3-169	13.7	3.74	3.38	1.37	0.18	0.17	33.3	26.0	0.18	1.42	16.5	100.0
87-3-174	24.8	6.81	3.44	1.47	1.18	0.45	33.6	15.9	0.31	1.70	10.2	100.0
87-3-182	19.4	5.65	3.65	1.17	0.42	0.68	33.3	21.0	0.26	1.54	12.8	100.1
87-3-192	16.7	3.80	5.21	0.98	0.38	0.71	30.5	20.0	0.17	1.63	19.8	100.0
87-3-212	20.7	5.53	3.35	1.40	0.22	0.78	33.1	19.1	0.26	1.56	14.1	100.2
87-3-232	20.5	5.33	3.60	1.20	0.17	0.57	33.0	19.6	0.23	1.61	14.4	100.3
87-3-242	27.9	9.15	2.59	2.00	0.52	2.02	23.1	14.0	0.40	1.07	17.0	99.9
87-3-262	26.3	8.22	2.09	3.87	0.33	1.47	19.5	16.5	0.34	0.82	20.5	100.0
87-3-282	37.0	11.7	2.00	4.61	0.29	2.15	17.6	7.73	0.48	0.87	15.3	99.8
87-3-292	28.7	7.28	2.81	3.94	0.26	1.26	19.9	15.1	0.29	0.92	19.5	100.0
87-3-312	34.8	10.0	1.54	3.77	0.58	1.07	21.4	11.5	0.43	0.67	14.4	100.2
87-3-336	27.5	6.84	2.10	2.68	0.46	1.04	23.0	14.3	0.28	0.94	21.0	100.2
87-3-346	26.8	7.74	2.44	3.50	0.40	1.18	21.0	15.4	0.34	1.01	20.3	100.2
87-3-362	50.7	17.5	0.44	3.05	1.12	3.75	13.5	1.90	0.69	0.18	6.47	99.5
87-3-382	53.9	18.2	0.37	2.71	1.21	4.55	10.6	1.23	0.71	0.10	5.08	98.8
87-3-392	53.1	18.6	0.35	2.52	1.01	4.90	10.7	1.13	0.70	0.11	5.39	98.7
87-3-412	53.1	19.2	0.31	2.47	1.00	4.90	12.5	0.69	0.73	0.11	4.31	99.5
87-3-422	52.5	17.6	0.50	2.92	0.85	4.68	10.7	2.30	0.67	0.11	6.00	99.0
87-3-432	48.4	17.5	1.13	2.95	0.78	4.82	10.1	4.48	0.69	0.34	7.47	98.8
87-3-462	54.2	19.8	0.35	2.82	1.13	5.32	9.68	0.49	0.76	0.11	4.31	99.1
87-3-492	52.7	18.8	0.41	2.80	0.94	5.03	10.6	1.74	0.74	0.12	5.16	99.2
87-3-532	54.8	19.7	0.26	2.73	0.98	5.28	10.1	0.38	0.76	0.09	4.16	99.4
87-3-562	53.6	19.0	0.45	2.85	1.03	4.88	10.5	1.19	0.75	0.13	4.85	99.4
87-3-592	51.9	19.1	1.51	3.13	0.98	4.99	10.2	0.47	0.75	0.13	5.47	98.8
87-3-622	45.2	14.2	12.2	2.86	1.28	3.43	6.25	0.34	0.66	0.11	13.1	99.8

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ PPM	RB	SR	Y	ZR	NB	BA
87-3-20	101	134	11	44	17	616
87-3-32	57	152	16	48	22	1230
87-3-42	79	146	17	100	17	752
87-3-62	78	144	22	64	10	770
87-3-82	38	128	<10	11	21	399
87-3-92	26	188	12	<10	17	526
87-3-102	51	364	11	<10	24	1820
87-3-112	94	347	30	90	25	1930
87-3-127	63	161	<10	11	15	616
87-3-142	88	99	<10	42	15	908
87-3-152	49	206	<10	<10	11	807
87-3-169	29	152	<10	<10	25	314
87-3-174	33	263	18	<10	31	725
87-3-182	<10	226	<10	<10	15	1400
87-3-192	45	291	11	<10	14	891
87-3-212	43	142	<10	<10	16	611
87-3-232	<10	140	<10	<10	35	527
87-3-242	81	148	13	37	18	909
87-3-262	57	143	12	28	28	571
87-3-282	89	184	26	55	16	607
87-3-292	42	186	<10	<10	14	443
87-3-312	46	101	17	35	28	481
87-3-336	33	156	<10	12	20	628
87-3-346	54	143	12	48	15	567
87-3-362	162	66	28	118	17	1120
87-3-382	167	41	<10	123	34	1040
87-3-392	188	46	25	116	25	1010
87-3-412	198	27	18	115	31	1040
87-3-422	203	41	23	101	35	865
87-3-432	165	59	27	106	20	825
87-3-462	207	53	23	127	27	1000
87-3-492	196	49	37	117	17	895
87-3-532	212	35	33	142	12	942
87-3-562	190	46	24	129	10	841
87-3-592	185	127	13	132	19	854
87-3-622	138	559	18	99	25	494

XRAL

CORRECTED REPORT

CERTIFICATE OF ANALYSIS

REPORT 3905

TO: MARITIME RESOURCE RESEARCH LIMITED
ATTN: G. CHRISTOPHER ROBERTS
301 WOODSTOCK ROAD
FREDERICTON, NEW BRUNSWICK
E3B 2H9

CUSTOMER No. 1417

DATE SUBMITTED
4-Jan-88

REF. FILE 30913-L2

Total Pages 14

82 C.ROCKS

	METHOD	DETECTION LIMIT
AU PPB	FADCP	1.
LI PPM	AA	10.
BE PPM	DCP	5.
B PPM	DCP	10.
MRMAJ %	MR	0.01
S PPM	XRF	100.
V PPM	DCP	10.
CR PPM	DCP	2.
CO PPM	ICPMS	1.
NI PPM	DCP	1.
CU PPM	DCP	0.5
ZN PPM	DCP	0.5
GA PPM	ICPMS	1.
GE PPM	DCP	10.
AS PPM	FAA	1.
SE PPM	GFAA	3.
MRMIN PPM	MR	10.
MO PPM	ICPMS	2.
PD PPB	FADCP	2.
AG PPM	DCP	0.5
CD PPM	DCP	1.
IN PPM	ICPMS	1.

	METHOD	DETECTION LIMIT
SN PPM	XRF	10.
SB PPM	FAA	0.2
CS PPM	ICPMS	1.
LA PPM	ICPMS	2.
CE PPM	ICPMS	1.
ND PPM	ICPMS	0.5
SM PPM	ICPMS	0.5
EU PPM	ICPMS	0.1
GD PPM	ICPMS	0.5
DY PPM	ICPMS	0.5
ER PPM	ICPMS	0.5
LU PPM	ICPMS	0.1
HF PPM	ICPMS	1.
TA PPM	ICPMS	1.
W PPM	ICPMS	3.
PT PPB	FADCP	10.
TL PPM	ICPMS	1.
PB PPM	DCP	2.
BI PPM	ICPMS	0.5
TH PPM	ICPMS	1.
U PPM	ICPMS	0.5

X-RAY ASSAY LABORATORIES LIMITED

DATE 24-FEB-88

CERTIFIED BY .....

NOTE: DETECTION LIMITS VARY WITH SAMPLE SIZE.

SAMPLE	AU PPB	LI PPM	BE PPM	B PPM	S PPM	V PPM	CR PPM	CO PPM	NI PPM
87-3-127	<1	40	<5	70	300	80	100	34	91
87-4-10	6	20	10	10	180	10	<2	129	28
87-4-13	<1	50	<5	40	40	50	110	62	99
87-4-17	<1	30	5	70	80	30	80	57	76
87-4-21	<1	30	<5	50	180	40	96	60	94
87-4-33	2	40	5	50	140	30	74	82	82
87-4-43	4	70	5	50	1700	30	56	98	72
87-4-50	3	30	5	50	1300	30	60	109	76
87-4-70	5	50	5	60	3500	20	36	111	60
87-4-90	3	60	5	50	3900	30	66	71	76
87-4-110	2	20	5	20	780	<10	16	152	48
87-4-112	1	20	10	90	900	20	28	136	45
87-4-130	<1	30	5	90	140	20	34	139	45
87-4-150	<2	<10	5	90	2100	20	38	102	51
87-4-170	<1	50	5	60	520	30	82	94	90
87-4-182	2	20	5	70	580	30	44	117	55
87-4-195	5	40	5	70	620	40	70	104	81
87-4-206	3	10	5	100	1600	20	32	127	50
87-4-220	<1	20	10	160	2400	20	38	97	56
87-4-231	<2	10	5	90	1000	30	60	154	74
87-4-246	<1	30	5	120	480	10	56	136	88
87-4-261	6	50	5	120	4400	50	62	151	72
87-4-268	<1	40	5	140	680	30	40	117	53
87-4-280	<1	50	5	60	760	110	92	51	75
87-4-300	4	60	<5	60	2300	70	76	66	70
87-4-320	3	60	<5	80	900	150	100	48	76
87-4-330	2	50	<5	80	1100	100	94	49	77
87-4-350	1	40	<5	60	2600	120	96	62	78
87-4-360	4	50	<5	40	7200	90	92	101	90
87-4-370	2	30	<5	20	1900	30	50	115	64
87-4-390	1	10	<5	<10	560	20	50	123	68
87-4-410	7	20	5	10	800	10	34	136	49
87-4-420	1	<10	5	90	880	20	52	120	62
87-4-440	3	20	<5	70	1300	30	70	110	83
87-4-451	<1	30	<5	110	720	20	70	127	84
87-4-460	<1	40	5	110	1200	30	48	149	64
87-4-470	1	30	5	90	1100	30	65	92	75
87-4-480	<1	30	<5	70	1100	50	82	120	93
87-4-503	<1	<10	<5	130	1500	20	62	111	87
87-4-520	<1	10	5	110	500	20	62	130	73
87-4-539	7	50	5	50	760	60	72	82	78
87-4-550	2	20	5	40	100	10	24	129	43
87-4-561	4	10	5	50	2900	20	34	130	57
87-4-571	<1	20	5	60	1700	30	52	107	70
87-4-580	2	30	5	80	840	30	46	143	64
87-4-600	<1	30	5	60	1600	30	56	106	74
87-4-611	5	20	5	80	140	30	66	93	86
87-5-10	<1	70	5	20	360	30	38	111	53
87-5-20	1	100	5	40	1600	20	24	136	40
87-5-30	2	80	5	80	3100	50	62	96	78

SAMPLE	AU PPB	LI PPM	BE PPM	B PPM	S PPM	V PPM	CR PPM	CO PPM	NI PPM
87-5-40	<1	60	5	70	1100	40	50	131	51
87-5-50	1	60	5	50	1300	40	52	85	62
87-5-60	3	230	<5	110	1600	40	34	117	53
87-5-70	2	90	<5	70	2000	20	18	160	44
87-5-80	6	30	<5	40	2200	10	22	140	38
87-5-87	8	80	<5	30	4250	40	42	141	53
87-5-95	6	30	5	10	4000	50	50	129	58
87-5-100	4	20	<5	<10	640	<10	14	217	34
87-5-108	<1	40	<5	20	160	30	42	102	56
87-5-118	2	40	5	40	1300	30	32	131	49
87-5-128	6	20	10	80	860	30	34	117	42
87-5-138	3	40	5	30	1500	40	50	110	60
87-5-151	2	20	5	50	620	40	58	106	70
87-5-160	<1	20	5	60	460	30	64	119	72
87-5-170	<1	20	5	90	40	20	56	163	65
87-5-180	<1	30	5	60	600	80	56	138	64
87-5-200	<1	10	5	80	280	20	28	148	42
87-5-220	<1	20	5	80	120	30	42	149	55
87-5-240	1	20	10	40	790	30	26	121	42
87-5-245	<1	20	10	70	80	20	24	220	39
87-5-255	<1	10	5	110	600	20	34	125	52
87-5-275	10	<10	5	180	20	20	30	128	47
87-5-295	<1	20	5	60	280	40	62	109	73
87-5-305	17	30	5	90	440	30	32	164	48
87-5-315	<1	20	5	10	1700	30	30	135	39
87-5-335	<1	20	5	50	160	40	50	138	60
87-5-356	<1	40	5	30	3800	40	48	163	60
87-5-370	<1	50	5	70	940	90	76	57	62
87-5-390	<1	60	5	60	3300	110	90	66	71
87-5-410	1	50	5	70	3500	90	80	90	67
87-5-430	8	30	5	80	180	60	68	46	63

SAMPLE	CU PPM	ZN PPM	GA PPM	GE PPM	AS PPM	SE PPM	MO PPM	PD PPB
87-3-127	110.	100.	23	<10	<1	<3	3	2
87-4-10	68.0	29.0	16	<10	5	<3	15	2
87-4-13	5.5	110.	20	<10	<1	<3	3	<2
87-4-17	24.0	93.0	20	<10	1	<3	6	<2
87-4-21	47.0	98.0	20	<10	<1	<3	4	3
87-4-33	14.0	86.0	21	<10	1	<3	7	2
87-4-43	89.0	83.0	22	<10	7	<3	10	2
87-4-50	130.	83.0	20	<10	10	<3	11	<2
87-4-70	44.0	62.0	18	<10	10	<3	16	3
87-4-90	77.0	96.0	21	<10	5	<3	12	3
87-4-110	15.0	36.0	22	<10	5	<3	20	<2
87-4-112	28.0	48.0	20	<10	13	<3	15	<2
87-4-130	54.0	55.0	20	<10	13	<3	14	<2
87-4-150	42.0	61.0	20	<10	13	<3	12	2
87-4-170	53.0	100.	24	<10	10	<3	12	<2
87-4-182	18.0	66.0	19	<10	12	<3	10	<2
87-4-195	65.0	96.0	24	<10	10	<3	9	<2
87-4-206	41.0	52.0	24	<10	10	<3	18	<2
87-4-220	37.0	59.0	22	<10	15	<3	11	3
87-4-231	66.0	89.0	22	<10	10	<3	16	3
87-4-246	38.0	81.0	27	<10	5	<3	15	<2
87-4-261	120.	90.0	20	<10	20	<3	10	3
87-4-268	51.0	63.0	21	<10	10	<3	11	3
87-4-280	94.0	120.	22	<10	9	<3	2	2
87-4-300	86.0	110.	21	<10	10	<3	4	3
87-4-320	110.	130.	23	<10	5	<3	<2	<2
87-4-330	78.0	130.	24	<10	5	<3	2	2
87-4-350	120.	130.	25	<10	8	<3	10	<2
87-4-360	94.0	120.	24	<10	22	<3	8	2
87-4-370	56.0	81.0	24	<10	8	<3	11	2
87-4-390	59.0	82.0	23	<10	8	<3	9	2
87-4-410	36.0	64.0	22	<10	11	<3	11	2
87-4-420	50.0	79.0	23	<10	8	<3	10	2
87-4-440	74.0	97.0	25	<10	7	<3	8	2
87-4-451	45.0	92.0	26	<10	6	<3	10	2
87-4-460	86.0	72.0	25	<10	5	<3	11	<2
87-4-470	34.0	90.0	24	<10	5	<3	9	2
87-4-480	87.0	110.	25	<10	5	<3	6	2
87-4-503	42.0	88.0	23	<10	6	<3	9	<2
87-4-520	14.0	85.0	24	<10	6	<3	9	2
87-4-539	73.0	120.	21	<10	6	<3	4	2
87-4-550	44.0	55.0	18	<10	6	<3	11	3
87-4-561	46.0	61.0	18	<10	10	<3	11	<2
87-4-571	91.0	82.0	18	<10	9	<3	9	3
87-4-580	63.0	83.0	21	<10	15	<3	14	<2
87-4-600	59.0	76.0	20	<10	11	<3	8	5
87-4-611	42.0	91.0	21	<10	6	<3	6	<2
87-5-10	52.0	62.0	14	<10	10	<3	8	<2
87-5-20	37.0	47.0	15	<10	20	<3	10	3
87-5-30	94.0	87.0	21	<10	13	<3	8	2

SAMPLE	CU PPM	ZN PPM	GA PPM	GE PPM	AS PPM	SE PPM	MO PPM	PD PPB
87-5-40	45.0	74.0	19	<10	13	<3	11	<2
87-5-50	55.0	88.0	21	<10	6	<3	13	<2
87-5-60	53.0	76.0	19	<10	12	<3	19	2
87-5-70	36.0	54.0	20	<10	12	<3	13	3
87-5-80	41.0	43.0	19	<10	10	<3	15	2
87-5-87	56.0	75.0	26	<10	18	<3	13	3
87-5-95	61.0	83.0	21	<10	21	<3	9	3
87-5-100	25.0	43.0	21	<10	10	<3	16	2
87-5-108	69.0	67.0	20	<10	12	<3	11	<2
87-5-118	35.0	64.0	15	<10	14	<3	13	<2
87-5-128	45.0	57.0	17	<10	16	<3	15	<2
87-5-138	85.0	73.0	20	<10	16	<3	14	<2
87-5-151	79.0	85.0	21	<10	10	<3	10	<2
87-5-160	28.0	81.0	22	<10	11	<3	10	<2
87-5-170	1.0	76.0	21	<10	11	<3	11	<2
87-5-180	410.	80.0	21	<10	10	<3	11	<2
87-5-200	13.0	54.0	19	<10	14	<3	16	<2
87-5-220	37.0	69.0	22	<10	12	<3	14	2
87-5-240	45.0	53.0	18	<10	16	<3	14	<2
87-5-245	1.5	47.0	18	<10	16	<3	15	<2
87-5-255	43.0	64.0	21	<10	11	<3	14	<2
87-5-275	23.0	59.0	17	<10	16	<3	13	<2
87-5-295	94.0	95.0	21	<10	5	<3	9	<2
87-5-305	30.0	67.0	20	<10	13	<3	13	<2
87-5-315	44.0	59.0	19	<10	10	<3	13	<2
87-5-335	50.0	86.0	24	<10	7	<3	11	<2
87-5-356	90.0	98.0	28	<10	9	<3	13	<2
87-5-370	72.0	120.	27	<10	2	<3	3	<2
87-5-390	80.0	130.	24	<10	10	<3	3	<2
87-5-410	100.	130.	24	<10	9	<3	5	3
87-5-430	55.0	120.	23	<10	1	<3	5	<3

SAMPLE	AG PPM	CD PPM	IN PPM	SN PPM	SB PPM	CS PPM	LA PPM	CE PPM
87-3-127	<0.5	<1	<1	<10	1.5	13	37	98
87-4-10	<0.5	<1	<1	<10	3.2	3	23	66
87-4-13	<0.5	<1	<1	<10	0.3	4	38	83
87-4-17	<0.5	<1	<1	<10	1.9	8	29	76
87-4-21	<0.5	<1	<1	<10	0.8	7	38	83
87-4-33	<0.5	<1	<1	<10	2.7	9	29	69
87-4-43	<0.5	<1	<1	<10	0.8	5	29	76
87-4-50	<0.5	<1	<1	<10	1.9	7	29	77
87-4-70	<0.5	<1	<1	<10	1.9	5	24	68
87-4-90	<0.5	<1	<1	<10	0.8	5	33	83
87-4-110	<0.5	<1	<1	<10	0.8	1	19	54
87-4-112	<0.5	<1	<1	<10	2.9	13	27	77
87-4-130	<0.5	<1	<1	<10	2.2	6	29	85
87-4-150	<0.5	<1	<1	<10	2.3	27	33	90
87-4-170	<0.5	<1	<1	<10	1.9	23	35	87
87-4-182	<0.5	<1	<1	<10	2.0	48	29	76
87-4-195	<0.5	<1	<1	<10	0.9	28	34	87
87-4-206	<0.5	<1	<1	<10	1.9	29	24	66
87-4-220	<0.5	<1	<1	<10	2.9	32	31	82
87-4-231	<0.5	<1	<1	<10	1.9	17	30	85
87-4-246	<0.5	<1	<1	<10	1.9	32	27	73
87-4-261	<0.5	<1	<1	<10	1.9	28	43	113
87-4-268	<0.5	<1	<1	<10	1.9	29	30	85
87-4-280	<0.5	<1	<1	<10	0.7	7	42	98
87-4-300	<0.5	<1	<1	<10	1.7	7	35	84
87-4-320	<0.5	<1	<1	<10	0.5	11	41	95
87-4-330	<0.5	<1	<1	<10	0.7	8	36	83
87-4-350	<0.5	<1	<1	<10	0.7	8	36	84
87-4-360	<0.5	<1	<1	<10	4.2	6	37	85
87-4-370	<0.5	<1	<1	<10	1.9	4	27	73
87-4-390	<0.5	<1	<1	<10	0.7	11	27	71
87-4-410	<0.5	<1	<1	<10	0.7	2	30	80
87-4-420	<0.5	<1	<1	<10	3.2	20	29	81
87-4-440	<0.5	<1	<1	<10	1.9	21	31	79
87-4-451	<0.5	<1	<1	<10	2.7	23	34	85
87-4-460	<0.5	<1	<1	<10	2.7	29	29	74
87-4-470	<0.5	<1	<1	<10	1.7	40	32	80
87-4-480	<0.5	<1	<1	<10	0.7	24	38	94
87-4-503	<0.5	<1	<1	<10	1.9	20	28	70
87-4-520	<0.5	<1	<1	<10	1.9	28	27	68
87-4-539	<0.5	<1	<1	<10	0.5	16	36	89
87-4-550	<0.5	<1	<1	<10	2.4	43	27	72
87-4-561	<0.5	<1	<1	<10	2.7	41	27	77
87-4-571	<0.5	<1	<1	<10	1.9	31	26	68
87-4-580	<0.5	<1	<1	<10	0.7	17	34	88
87-4-600	<0.5	<1	<1	<10	1.1	35	30	78
87-4-611	<0.5	<1	<1	<10	1.8	30	31	76
87-5-10	<0.5	<1	<1	<10	0.7	2	25	67
87-5-20	<0.5	<1	<1	<10	0.7	2	26	74
87-5-30	<0.5	<1	<1	<10	1.9	5	33	89

SAMPLE	AG PPM	CD PPM	IN PPM	SN PPM	SB PPM	CS PPM	LA PPM	CE PPM
87-5-40	<0.5	<1	<1	<10	0.8	5	27	69
87-5-50	<0.5	<1	<1	<10	0.7	5	29	72
87-5-60	<0.5	<1	<1	<10	0.8	10	27	71
87-5-70	<0.5	<1	<1	<10	0.9	8	21	57
87-5-80	<0.5	<1	<1	<10	0.7	5	21	59
87-5-87	<0.5	<1	<1	<10	1.3	5	38	99
87-5-95	<0.5	<1	<1	<10	0.8	4	33	84
87-5-100	<0.5	<1	<1	<10	0.6	2	16	46
87-5-108	<0.5	<1	<1	<10	1.3	9	32	86
87-5-118	<0.5	<1	<1	<10	0.6	5	27	72
87-5-128	<0.5	<1	<1	<10	1.6	11	33	93
87-5-138	<0.5	<1	<1	<10	0.8	6	29	78
87-5-151	<0.5	<1	<1	<10	2.7	16	29	73
87-5-160	<0.5	<1	<1	<10	2.7	21	27	66
87-5-170	<0.5	<1	<1	<10	3.2	34	27	67
87-5-180	<0.5	<1	<1	<10	0.8	24	31	79
87-5-200	<0.5	<1	<1	<10	2.7	50	26	71
87-5-220	<0.5	<1	<1	<10	0.7	42	28	74
87-5-240	<0.5	<1	<1	<10	0.7	49	27	77
87-5-245	<0.5	<1	<1	<10	1.6	59	22	66
87-5-255	<0.5	<1	<1	<10	1.1	31	29	78
87-5-275	<0.5	<1	<1	<10	3.0	25	27	76
87-5-295	<0.5	<1	<1	<10	0.8	27	30	78
87-5-305	<0.5	<1	<1	<10	3.0	22	31	82
87-5-315	<0.5	<1	<1	<10	2.2	18	31	90
87-5-335	<0.5	<1	<1	<10	2.2	21	29	75
87-5-356	<0.5	<1	<1	<10	2.2	8	31	80
87-5-370	<0.5	<1	<1	<10	1.5	11	41	97
87-5-390	<0.5	<1	<1	<10	1.8	9	36	87
87-5-410	<0.5	<1	<1	<10	0.8	9	36	83
87-5-430	<0.5	<1	<1	<10	0.6	8	35	81

SAMPLE	ND PPM	SM PPM	EU PPM	GD PPM	DY PPM	ER PPM	LU PPM	HF PPM
87-3-127	39.1	6.8	1.1	4.8	3.7	1.9	0.4	4
87-4-10	20.9	3.7	1.0	5.2	4.5	2.0	0.3	<1
87-4-13	31.8	4.7	1.5	4.3	3.7	2.1	0.4	4
87-4-17	31.4	5.7	2.0	6.9	5.2	2.4	0.4	3
87-4-21	33.1	5.0	1.8	5.8	3.8	1.9	0.5	4
87-4-33	26.6	4.9	1.7	5.3	3.6	1.9	0.4	3
87-4-43	28.0	5.7	1.8	6.3	5.1	2.2	0.4	2
87-4-50	28.9	4.9	1.6	6.5	4.8	2.2	0.4	2
87-4-70	23.7	4.7	1.5	7.0	4.8	2.0	0.3	1
87-4-90	33.0	6.4	1.8	7.7	5.2	2.5	0.5	2
87-4-110	18.4	3.3	1.0	5.1	3.8	2.1	0.3	<1
87-4-112	26.1	5.0	1.5	7.5	4.8	2.3	0.4	<1
87-4-130	29.5	5.9	1.4	6.2	5.4	2.5	0.4	<1
87-4-150	29.6	5.3	1.9	8.1	6.1	2.9	0.4	1
87-4-170	32.9	5.5	2.0	7.5	5.3	2.5	0.5	3
87-4-182	29.3	6.1	2.3	7.0	5.5	3.1	0.5	1
87-4-195	31.3	6.4	2.5	7.5	5.1	3.1	0.5	3
87-4-206	22.4	4.7	1.6	6.6	4.6	2.4	0.4	1
87-4-220	29.8	5.6	2.0	7.6	5.4	2.9	0.4	2
87-4-231	30.6	6.1	1.7	8.1	5.8	2.8	0.5	1
87-4-246	26.4	4.7	2.8	5.8	4.3	1.9	0.5	2
87-4-261	40.9	6.8	2.4	10.1	6.5	2.8	0.5	2
87-4-268	30.6	5.4	1.7	7.6	5.3	2.7	0.4	<1
87-4-280	38.9	6.4	2.0	7.8	4.4	2.3	0.6	3
87-4-300	36.0	6.6	1.8	5.2	4.7	2.0	0.4	3
87-4-320	40.0	6.7	2.0	7.3	4.3	1.9	0.4	3
87-4-330	34.5	6.0	1.8	6.8	4.5	2.1	0.4	3
87-4-350	36.4	6.4	1.5	7.0	3.9	2.2	0.3	3
87-4-360	35.6	5.9	1.6	7.2	4.7	2.3	0.4	3
87-4-370	28.1	6.1	1.4	6.8	4.9	3.3	0.5	<1
87-4-390	26.5	4.8	1.6	6.4	4.5	2.4	0.4	2
87-4-410	29.5	5.2	1.7	7.2	5.1	2.0	0.5	<1
87-4-420	27.8	5.7	2.0	6.8	4.9	2.9	0.4	<1
87-4-440	29.5	5.4	2.3	6.2	4.5	2.4	0.5	<1
87-4-451	31.0	5.6	4.3	6.7	4.9	2.4	0.5	2
87-4-460	26.5	3.9	5.6	5.7	4.2	1.6	0.4	2
87-4-470	28.9	5.3	5.5	6.7	4.8	2.6	0.4	<1
87-4-480	36.5	5.5	2.4	7.1	5.7	2.3	0.5	2
87-4-503	25.1	3.9	4.3	5.5	3.5	2.1	0.5	2
87-4-520	26.6	5.3	2.3	5.9	4.2	2.5	0.3	2
87-4-539	36.5	6.8	1.8	8.7	5.3	3.5	0.5	3
87-4-550	24.7	4.9	1.8	6.9	4.8	2.5	0.4	<1
87-4-561	29.0	5.8	2.2	7.9	5.2	3.1	0.4	<1
87-4-571	27.7	4.7	1.5	6.6	4.7	2.3	0.4	2
87-4-580	35.1	6.7	1.9	8.2	5.8	3.1	0.5	2
87-4-600	29.5	5.2	2.3	6.7	5.0	2.9	0.5	2
87-4-611	31.1	5.2	1.5	5.0	4.6	2.1	0.4	1
87-5-10	24.4	4.3	1.2	5.6	3.6	2.0	0.3	<1
87-5-20	25.9	5.1	1.5	7.9	5.0	2.2	0.4	<1
87-5-30	35.5	6.7	1.8	8.6	5.6	2.7	0.5	<1

SAMPLE	ND PPM	SM PPM	EU PPM	GD PPM	DY PPM	ER PPM	LU PPM	HF PPM
87-5-40	26.3	4.2	1.4	5.5	3.9	2.0	0.4	1
87-5-50	27.8	5.6	1.4	7.4	4.6	2.3	0.4	2
87-5-60	28.7	5.3	1.5	7.3	5.0	2.6	0.4	1
87-5-70	22.1	4.7	1.3	6.4	4.4	2.1	0.3	<1
87-5-80	21.9	4.2	1.4	5.7	4.3	2.0	0.3	<1
87-5-87	37.3	7.3	2.0	10.2	6.1	3.0	0.5	2
87-5-95	32.5	5.9	1.5	8.8	5.2	2.8	0.4	2
87-5-100	16.2	2.7	1.1	4.7	3.5	1.5	0.3	1
87-5-108	28.6	5.2	1.3	5.5	4.8	2.4	0.3	<1
87-5-118	24.2	4.2	1.2	6.2	3.8	1.8	0.4	2
87-5-128	34.2	5.7	2.0	9.1	5.1	2.7	0.4	2
87-5-138	29.6	4.9	1.5	7.2	5.0	2.3	0.4	2
87-5-151	27.0	4.4	2.3	6.5	3.9	2.0	0.4	2
87-5-160	25.4	4.7	2.8	6.1	4.2	2.0	0.3	2
87-5-170	26.2	5.3	1.9	6.5	4.3	2.3	0.3	2
87-5-180	31.0	6.2	2.7	7.0	4.7	2.6	0.3	2
87-5-200	24.7	5.1	3.2	7.4	5.5	2.7	0.3	1
87-5-220	27.9	5.1	1.8	7.3	5.1	2.3	0.4	2
87-5-240	27.6	5.2	3.6	7.6	5.3	2.3	0.4	1
87-5-245	22.4	3.8	1.3	6.6	4.3	2.0	0.3	<1
87-5-255	28.5	4.5	1.6	7.3	4.8	2.4	0.3	<1
87-5-275	26.6	4.5	1.5	7.4	4.5	2.0	0.3	1
87-5-295	28.7	4.3	1.8	6.8	4.8	2.1	0.3	2
87-5-305	29.7	4.9	1.8	8.4	5.2	2.4	0.3	1
87-5-315	30.4	5.2	2.9	8.3	5.1	2.3	0.3	<1
87-5-335	28.6	4.6	4.4	7.3	4.4	2.1	0.4	2
87-5-356	31.3	5.1	1.7	8.3	4.7	1.8	0.3	3
87-5-370	40.6	6.2	2.1	9.4	4.9	2.0	0.4	3
87-5-390	35.5	6.9	1.7	7.8	3.8	2.3	0.4	3
87-5-410	32.7	6.1	1.6	7.6	3.9	2.3	0.3	3
87-5-430	33.5	5.3	1.6	7.3	3.9	1.5	0.3	3

SAMPLE	TA PPM	W PPM	PT PPB	TL PPM	PB PPM	BI PPM	TH PPM	U PPM
87-3-127	2	4	<10	<1	6	0.5	14	2.6
87-4-10	<1	14	<10	<1	6	<0.5	1	1.5
87-4-13	1	3	<10	<1	8	<0.5	12	2.5
87-4-17	1	4	<10	<1	<2	<0.5	8	1.8
87-4-21	1	4	<10	<1	38	<0.5	12	2.2
87-4-33	1	4	2	<1	10	<0.5	9	1.9
87-4-43	1	5	<10	<1	14	<0.5	7	1.7
87-4-50	<1	5	<10	<1	8	<0.5	7	1.8
87-4-70	<1	4	<10	<1	12	<0.5	4	1.2
87-4-90	<1	<3	<10	<1	14	<0.5	8	2.2
87-4-110	<1	<3	<10	<1	4	<0.5	3	0.6
87-4-112	<1	4	<10	<1	6	<0.5	3	1.0
87-4-130	<1	5	10	<1	<2	<0.5	4	1.5
87-4-150	<1	<3	<10	<1	<2	<0.5	4	1.1
87-4-170	1	5	<10	<1	10	<0.5	10	2.1
87-4-182	<1	6	<10	<1	4	<0.5	5	1.6
87-4-195	1	5	<10	<1	22	<0.5	9	2.6
87-4-206	<1	3	<10	<1	16	<0.5	3	1.1
87-4-220	<1	4	<10	<1	<2	<0.5	6	1.8
87-4-231	<1	5	<10	<1	16	<0.5	3	1.4
87-4-246	<1	5	<10	<1	4	<0.5	6	2.7
87-4-261	<1	5	<10	<1	10	<0.5	7	2.0
87-4-268	<1	5	10	<1	<2	<0.5	4	1.2
87-4-280	1	<3	10	<1	12	<0.5	12	2.6
87-4-300	1	<3	<10	<1	22	<0.5	11	2.8
87-4-320	1	<3	<10	<1	38	0.6	12	2.8
87-4-330	1	4	<10	<1	16	1.3	11	2.3
87-4-350	1	4	<10	<1	20	<0.5	11	3.2
87-4-360	1	<3	<10	<1	24	<0.5	10	2.8
87-4-370	<1	3	<10	<1	10	<0.5	6	1.7
87-4-390	<1	4	<10	<1	<2	<0.5	5	1.5
87-4-410	<1	5	<10	<1	<2	<0.5	4	1.0
87-4-420	<1	<3	<10	<1	10	<0.5	5	1.2
87-4-440	<1	4	<10	<1	10	<0.5	7	1.7
87-4-451	1	6	<10	<1	12	<0.5	7	1.3
87-4-460	<1	10	<10	<1	<2	0.7	5	1.7
87-4-470	<1	5	<10	<1	18	<0.5	8	1.5
87-4-480	1	<3	<10	<1	20	<0.5	9	2.2
87-4-503	<1	3	<10	<1	4	<0.5	5	1.1
87-4-520	<1	4	<10	<1	4	<0.5	6	1.5
87-4-539	1	3	<10	<1	10	<0.5	9	2.1
87-4-550	<1	8	10	<1	14	<0.5	3	1.2
87-4-561	<1	8	<10	<1	<2	<0.5	3	1.2
87-4-571	<1	4	<10	<1	6	<0.5	5	1.8
87-4-580	<1	5	<10	<1	10	<0.5	6	1.8
87-4-600	<1	4	10	<1	22	<0.5	6	1.6
87-4-611	<1	4	<10	<1	4	<0.5	8	1.6
87-5-10	<1	<3	<10	<1	4	<0.5	5	1.4
87-5-20	<1	4	10	<1	4	<0.5	3	1.4
87-5-30	<1	4	<10	<1	16	<0.5	7	2.0

SAMPLE	TA PPM	W PPM	PT PPB	TL PPM	PB PPM	BI PPM	TH PPM	U PPM
87-5-40	<1	4	<10	<1	<2	<0.5	6	7.0
87-5-50	<1	4	<10	<1	12	<0.5	6	3.8
87-5-60	<1	<3	10	<1	12	<0.5	5	2.0
87-5-70	<1	<3	<10	<1	2	<0.5	3	14.3
87-5-80	<1	<3	<10	<1	4	<0.5	3	0.9
87-5-87	<1	4	10	<1	10	<0.5	6	2.4
87-5-95	<1	4	<10	<1	12	<0.5	6	2.3
87-5-100	<1	<3	10	<1	12	<0.5	2	0.7
87-5-108	<1	3	<10	<1	12	<0.5	5	1.9
87-5-118	<1	4	<10	<1	8	<0.5	4	1.8
87-5-128	<1	6	<10	<1	16	<0.5	4	1.1
87-5-138	<1	4	<10	<1	12	<0.5	5	1.5
87-5-151	<1	6	<10	<1	40	0.5	7	1.7
87-5-160	<1	5	<10	<1	<2	<0.5	7	1.4
87-5-170	<1	5	<10	<1	4	<0.5	5	1.4
87-5-180	<1	5	<10	<1	4	<0.5	6	2.3
87-5-200	<1	7	<10	<1	6	<0.5	3	1.1
87-5-220	<1	6	<10	<1	10	<0.5	5	1.3
87-5-240	<1	8	<10	<1	<2	<0.5	3	1.2
87-5-245	<1	8	<10	<1	6	<0.5	2	0.8
87-5-255	<1	6	<10	<1	20	<0.5	4	1.3
87-5-275	<1	8	<10	<1	4	<0.5	3	1.1
87-5-295	<1	5	<10	<1	28	0.5	4	1.6
87-5-305	<1	10	<10	<1	18	<0.5	4	1.7
87-5-315	<1	17	<10	<1	<2	<0.5	3	1.2
87-5-335	<1	5	<10	<1	16	<0.5	6	1.7
87-5-356	<1	3	<10	<1	16	0.5	7	2.7
87-5-370	1	<3	<10	<1	14	<0.5	10	2.4
87-5-390	1	<3	<10	<1	22	0.5	10	2.8
87-5-410	1	<3	<10	<1	34	<0.5	10	2.7
87-5-430	<1	<3	<10	<1	12	<0.5	9	2.0

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	LOI	SUM
87-3-127	52.4	17.3	0.33	2.85	3.11	3.57	9.50	3.41	0.74	0.09	5.31	98.8
87-4-10	7.08	2.42	4.03	0.80	0.47	0.32	47.2	20.7	0.10	1.82	15.2	100.2
87-4-13	52.1	17.2	0.32	3.36	3.81	2.87	8.63	4.10	0.73	0.07	5.23	98.6
87-4-17	38.8	12.4	1.32	2.75	2.02	3.25	18.0	9.17	0.53	0.64	10.8	99.8
87-4-21	47.0	17.5	0.40	3.38	4.15	2.78	10.3	5.60	0.76	0.15	6.47	98.7
87-4-33	42.2	12.8	1.06	2.64	1.77	3.38	16.6	9.85	0.57	0.51	8.47	100.1
87-4-43	30.6	9.50	1.91	2.29	1.16	1.76	22.4	13.4	0.42	0.84	15.6	100.0
87-4-50	30.6	9.82	2.26	2.11	1.12	1.54	23.1	14.4	0.44	1.04	13.8	100.3
87-4-70	22.9	6.26	3.09	1.79	0.56	1.41	27.1	15.7	0.27	1.41	19.8	100.4
87-4-90	37.3	12.1	1.41	3.18	1.28	1.77	19.7	10.5	0.50	0.61	11.8	100.3
87-4-110	9.94	2.72	3.80	1.58	0.39	0.60	25.9	27.9	0.14	1.24	25.6	99.9
87-4-112	19.3	5.06	3.57	1.41	0.47	0.47	32.1	19.9	0.23	1.61	16.2	100.4
87-4-130	17.8	5.63	4.31	1.44	0.33	0.33	30.7	20.3	0.25	1.64	17.2	100.0
87-4-150	25.9	6.31	3.45	1.36	0.63	0.68	31.0	16.3	0.25	1.79	12.0	99.8
87-4-170	39.0	13.5	1.29	2.62	1.45	2.77	16.8	11.7	0.60	0.52	9.23	99.7
87-4-182	28.6	7.19	3.37	1.64	1.00	1.31	32.3	14.2	0.31	1.52	8.70	100.4
87-4-195	34.8	12.8	1.78	2.58	1.22	2.79	21.4	11.6	0.55	0.76	8.77	99.4
87-4-206	20.8	4.85	3.53	1.42	0.46	0.47	30.0	22.1	0.22	1.52	14.2	99.7
87-4-220	21.4	5.95	3.69	1.41	0.39	0.60	34.4	17.6	0.27	1.81	12.5	100.1
87-4-231	33.0	10.2	2.19	1.96	1.25	2.00	25.3	13.7	0.45	1.07	8.70	100.0
87-4-246	30.1	9.42	2.31	1.94	1.08	2.27	20.5	19.1	0.43	0.81	10.7	99.1
87-4-261	32.6	10.5	1.97	2.33	0.85	1.75	30.1	10.1	0.47	1.24	8.00	100.1
87-4-268	24.7	6.85	2.86	1.69	0.48	0.81	31.6	17.8	0.33	1.46	11.5	100.2
87-4-280	51.2	17.9	0.32	3.00	2.17	3.75	12.0	2.89	0.74	0.17	4.85	99.1
87-4-300	48.9	16.1	0.85	2.94	1.35	3.55	12.0	5.99	0.63	0.35	6.93	99.7
87-4-320	54.9	19.4	0.21	2.59	1.28	5.07	9.94	1.52	0.73	0.11	4.31	100.2
87-4-330	52.5	17.9	0.38	2.78	1.31	4.19	11.7	3.20	0.71	0.20	5.16	100.2
87-4-350	52.3	17.5	0.37	2.79	1.67	3.97	11.6	2.92	0.70	0.21	5.16	99.3
87-4-360	47.2	15.4	0.74	3.34	1.89	2.58	14.7	5.19	0.65	0.37	6.85	99.0
87-4-370	30.2	9.30	2.37	4.13	0.74	0.72	22.2	15.0	0.40	0.91	14.4	100.4
87-4-390	29.5	9.01	2.50	3.68	1.20	0.61	23.5	15.4	0.39	0.97	13.5	100.4
87-4-410	19.0	6.36	3.88	1.73	0.79	0.76	27.4	18.7	0.29	1.36	19.9	100.2
87-4-420	26.7	8.11	3.41	1.89	1.17	1.57	28.1	15.9	0.36	1.28	11.2	99.9
87-4-440	38.3	12.3	1.34	2.34	2.42	2.34	18.0	12.6	0.54	0.64	8.[illegible]	99.6
87-4-451	35.0	11.4	2.73	2.36	2.15	2.14	19.9	14.5	0.52	0.77	7.[illegible]	99.5
87-4-460	30.0	8.30	3.91	1.74	1.60	2.40	23.3	16.6	0.42	1.21	9.93	100.6
87-4-470	37.6	11.5	1.97	2.25	2.14	3.15	19.5	12.4	0.57	0.90	7.00	99.9
87-4-480	43.3	14.4	0.91	2.60	3.01	2.79	16.1	9.47	0.62	0.49	5.23	99.2
87-4-503	34.9	10.1	2.93	2.01	2.29	2.01	20.9	15.3	0.52	0.96	6.08	99.0
87-4-520	35.9	10.9	1.74	2.20	2.36	2.35	22.6	13.7	0.48	0.79	5.85	99.2
87-4-539	43.4	15.0	0.95	4.02	1.41	2.94	16.6	7.40	0.61	0.56	6.62	99.6
87-4-550	22.8	5.45	2.83	1.77	1.06	1.02	29.3	21.4	0.23	1.44	12.2	99.6
87-4-561	22.0	6.19	2.82	1.67	0.90	1.39	35.9	17.5	0.28	1.62	9.70	100.1
87-4-571	35.1	10.4	1.49	2.54	1.65	1.96	22.3	14.3	0.44	0.75	9.31	100.4
87-4-580	31.0	10.3	2.47	3.39	1.09	1.01	26.1	13.9	0.42	1.13	9.08	100.0
87-4-600	36.3	10.5	1.72	1.98	1.99	2.06	24.8	11.6	0.45	1.00	7.31	100.0
87-4-611	37.7	12.3	1.40	2.25	2.27	2.63	16.6	13.9	0.53	0.64	9.16	99.6
87-5-10	25.3	7.24	2.38	1.95	0.64	0.48	26.0	17.0	0.33	1.16	17.4	99.9
87-5-20	18.3	5.08	2.88	1.65	0.45	0.76	30.5	16.8	0.23	1.51	21.6	99.8
87-5-30	31.2	10.7	2.09	2.06	1.72	1.83	20.7	12.7	0.47	0.96	15.9	100.4

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

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SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	LOI	SUM
87-5-40	31.0	9.56	1.54	2.09	1.00	1.83	21.7	13.2	0.42	0.72	16.7	99.8
87-5-50	32.0	10.7	1.73	3.64	1.02	1.46	19.8	14.3	0.45	0.81	14.4	100.4
87-5-60	27.5	7.88	2.30	3.99	0.26	1.44	22.6	12.4	0.34	1.05	20.2	100.0
87-5-70	18.6	5.10	2.72	2.29	0.48	1.26	26.3	18.2	0.21	1.24	24.0	100.5
87-5-80	19.9	4.67	2.40	1.71	0.60	1.07	25.4	19.8	0.21	1.13	23.2	100.1
87-5-87	24.4	8.64	2.30	4.24	0.54	0.68	25.0	15.2	0.38	1.19	16.8	99.4
87-5-95	31.0	10.0	2.08	2.87	1.18	1.08	25.0	11.6	0.42	0.99	14.0	100.3
87-5-100	18.1	3.34	3.70	1.18	0.35	0.17	27.4	22.3	0.13	1.13	21.7	99.6
87-5-108	26.9	8.93	2.55	2.15	1.53	0.87	23.5	16.4	0.37	1.06	15.5	99.9
87-5-118	24.1	7.44	2.51	2.39	0.89	0.72	27.6	16.2	0.32	1.06	16.2	99.5
87-5-128	20.9	6.55	3.40	1.47	0.56	0.88	31.4	17.9	0.28	1.68	15.0	100.1
87-5-138	29.1	9.02	2.45	1.86	1.70	1.01	24.9	13.7	0.39	1.18	14.5	99.9
87-5-151	33.3	10.2	2.60	1.96	2.58	1.83	21.2	13.8	0.44	0.84	10.3	99.3
87-5-160	33.5	10.7	2.41	2.45	2.43	2.55	21.1	12.9	0.48	0.85	8.62	98.4
87-5-170	28.5	9.47	2.32	2.52	1.03	2.87	27.3	15.3	0.42	1.14	9.08	100.2
87-5-180	35.8	10.3	1.88	2.71	2.56	1.78	23.4	13.0	0.43	1.00	6.93	100.3
87-5-200	21.5	5.37	4.97	1.50	0.81	1.10	34.0	20.0	0.23	1.70	9.00	100.3
87-5-220	28.0	8.27	2.39	2.09	1.58	1.84	29.7	17.1	0.36	1.22	7.47	100.2
87-5-240	22.1	5.65	3.10	1.60	1.23	1.10	37.4	17.4	0.24	2.00	7.62	99.9
87-5-245	20.2	4.81	2.76	1.56	0.83	1.05	40.1	19.2	0.21	1.54	7.08	99.5
87-5-255	24.1	7.26	2.95	2.23	1.05	1.37	31.4	19.4	0.31	1.32	8.54	100.1
87-5-275	19.6	6.05	4.25	1.65	0.95	0.95	32.6	23.0	0.27	1.56	8.62	99.6
87-5-295	35.5	11.5	1.67	2.91	2.32	2.14	22.1	13.2	0.48	0.78	7.31	100.1
87-5-305	25.1	7.32	3.06	2.29	1.33	0.99	31.1	18.2	0.32	1.42	8.70	100.0
87-5-315	20.6	5.17	4.79	1.29	0.77	1.15	33.7	17.5	0.24	1.80	12.5	99.8
87-5-335	32.8	9.79	3.45	2.27	2.30	1.79	22.9	12.9	0.42	0.91	9.77	99.9
87-5-356	33.5	10.6	2.05	4.06	0.97	1.24	19.8	14.3	0.44	0.79	12.1	99.9
87-5-370	49.0	17.0	0.82	2.93	1.39	4.07	12.6	4.29	0.66	0.31	6.08	99.3
87-5-390	51.3	17.4	0.55	3.01	1.43	4.01	12.5	2.95	0.68	0.24	5.31	99.5
87-5-410	47.1	16.1	0.90	3.14	0.99	3.79	13.3	5.55	0.64	0.31	7.47	99.4
87-5-430	45.3	15.4	1.64	2.57	0.89	3.81	11.5	7.98	0.59	0.39	9.00	99.2

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ PPM	RB	SR	Y	ZR	NB	BA
87-3-127	168	105	16	120	24	858
87-4-10	<10	131	<10	<10	18	394
87-4-13	124	146	26	122	13	1250
87-4-17	121	212	32	76	14	1020
87-4-21	108	224	11	115	14	1800
87-4-33	136	181	15	76	20	1420
87-4-43	71	172	29	58	15	1140
87-4-50	71	158	12	48	15	646
87-4-70	57	160	17	<10	<10	465
87-4-90	62	128	24	69	18	594
87-4-110	19	159	<10	<10	<10	295
87-4-112	14	228	19	<10	35	596
87-4-130	13	229	24	13	27	283
87-4-150	28	367	15	<10	35	723
87-4-170	103	260	<10	75	28	1170
87-4-182	68	491	16	11	21	1510
87-4-195	103	320	12	79	<10	2670
87-4-206	61	341	<10	<10	21	870
87-4-220	44	175	19	13	22	313
87-4-231	81	207	24	40	17	965
87-4-246	72	250	<10	31	<10	3500
87-4-261	83	227	20	55	11	1060
87-4-268	47	190	18	21	21	528
87-4-280	142	73	32	110	40	894
87-4-300	134	118	24	99	12	645
87-4-320	206	48	13	126	<10	769
87-4-330	158	62	29	122	27	692
87-4-350	156	37	21	113	26	715
87-4-360	110	106	22	77	11	557
87-4-370	25	149	15	33	22	350
87-4-390	40	140	15	29	23	565
87-4-410	40	221	<10	18	25	304
87-4-420	73	224	16	47	<10	1150
87-4-440	79	240	28	68	21	1930
87-4-451	80	546	<10	50	<10	5370
87-4-460	84	658	13	<10	19	9770
87-4-470	122	577	24	50	<10	7600
87-4-480	113	335	15	90	32	1760
87-4-503	66	892	23	19	27	7700
87-4-520	103	385	<10	56	31	2620
87-4-539	122	149	30	88	28	666
87-4-550	62	139	<10	<10	29	959
87-4-561	71	134	<10	22	<10	1020
87-4-571	94	119	13	71	22	661
87-4-580	61	156	12	55	26	674
87-4-600	81	162	29	44	26	1970
87-4-611	109	187	14	66	<10	1730
87-5-10	33	146	13	17	26	309
87-5-20	52	189	<10	<10	13	322
87-5-30	84	200	24	60	25	448

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SAMPLE \ PPM	RB	SR	Y	ZR	NB	BA
87-5-40	68	110	16	45	19	455
87-5-50	41	120	21	62	29	359
87-5-60	49	294	<10	25	33	252
87-5-70	57	262	18	<10	22	311
87-5-80	51	124	<10	<10	13	292
87-5-87	33	122	19	38	29	212
87-5-95	52	122	20	54	23	388
87-5-100	12	188	<10	<10	<10	368
87-5-108	43	231	20	28	16	960
87-5-118	50	148	10	12	13	530
87-5-128	70	178	<10	18	12	674
87-5-138	40	232	19	45	31	543
87-5-151	90	461	12	53	14	1790
87-5-160	111	481	18	46	13	3230
87-5-170	112	369	15	38	23	1740
87-5-180	89	1800	12	16	16	2420
87-5-200	68	468	<10	<10	11	816
87-5-220	88	435	24	11	23	855
87-5-240	68	623	26	<10	<10	3270
87-5-245	85	430	<10	<10	24	582
87-5-255	55	449	14	14	20	779
87-5-275	<10	376	<10	<10	10	675
87-5-295	22	370	<10	54	29	1500
87-5-305	50	342	14	<10	11	713
87-5-315	48	822	17	<10	<10	1850
87-5-335	53	834	13	30	10	4260
87-5-356	47	158	15	43	19	479
87-5-370	162	92	18	99	17	751
87-5-390	168	80	28	91	<10	744
87-5-410	142	90	<10	91	24	653
87-5-430	140	189	19	55	19	609

APPENDIX NUMBER 2

Univariate Statistical Analysis

Description of Statistics

Results for 146 samples in the deposit
Excludes ddh 87-3 results

Introduction to SAS Descriptive Procedures

The following SAS descriptive procedures read through SAS data sets collecting univariate descriptive summary statistics, such as means, sums, standard deviations, and frequency counts. Two of the procedures also include bivariate measures.

MEANS	computes and prints means and other descriptive statistics
UNIVARIATE	computes univariate statistics including quantiles
SUMMARY	outputs descriptive statistics across classifications
FREQ	prints tables of frequency counts, crosstabulations, and bivariate measures of association for categorical variables
TABULATE	prints general tables of descriptive statistics
CORR	computes bivariate correlations and other measures of association for continuous variables.

Another descriptive procedure documented in the reporting section is:

CHART	draws bar charts and other charts of counts, means, or sums.

Comparison of Procedures

There are two basic kinds of variables—categorical and continuous. These two ways of treating values lead to two fundamental SAS descriptive procedures, PROC FREQ and PROC MEANS. The FREQ procedure collects frequency counts for categorical variables. The MEANS procedure accumulates means, standard deviations, and other statistics for continuous variables.

If you need a series of means for sub-groups of observations, you can use MEANS with a BY statement to control the classification. However, BY-group processing requires sorting the data set, which can be expensive for large data sets. Two other procedures, SUMMARY and TABULATE, can produce means across a classification without sorting. PROC SUMMARY is used to reduce a large amount of data to statistics placed on a SAS data set. PROC TABULATE is specialized for presenting descriptive statistics in hierarchical crosstabulations for either continuous or categorical variables.

Quantile statistics are much more expensive to compute than moment statistics like the mean and standard deviation. MEANS, SUMMARY, and TABULATE are unable to compute medians and other quantiles. You can use the UNIVARIATE procedure when you need selected quantiles and other distributional details. If you want a complete ranking of the data for computing other quantile statistics, then use PROC RANK.

In addition to these procedures, graphical procedures, such as CHART, can also effectively present descriptive statistics.

In addition to univariate statistics, bivariate statistics are available to measure the association between pairs of variables. For categorical variables, the FREQ procedure produces crosstabulations with chi-square and other bivariate test statistics. For continuous variables, the CORR procedure computes correlations and several other measures of association.

Keywords for Univariate Descriptive Statistics

A standardized set of keywords is used to refer to the univariate descriptive statistics in SAS procedures. These keywords are used in SAS statements to request statistics for printing or storing on an output data set.

Define the following:

x_i = the ith nonmissing observation on the variable
z_i = $(x_i - \text{MEAN})/\text{STD}$ standardized variables.

Then define the keyword statistics:

N	number of nonmissing observations
NMISS	number of missing observations
MIN	minimum value
MAX	maximum value
RANGE	MAX–MIN, the range from minimum to maximum
SUM	Σx_i, the total
MEAN	SUM/N, the arithmetic mean
USS	Σx_i^2, uncorrected sum of squares
CSS	USS–MEAN^{2}N, sum of squares corrected for the mean
VAR	CSS/(N – 1), the sample variance
STD	sqrt(VAR), the sample standard deviation
STDERR	STD/sqrtN, standard error of the mean
CV	(STD/MEAN) × 100, coefficient of variation
SKEWNESS	$\Sigma z_i^3 \times N/(N-1)(N-2)$, measures sidedness
KURTOSIS	$\Sigma z_i^4 \times N(N+1)/(N-1)(N-2)(N-3) - 3(N-1)^2/(N-2)(N-3)$, measures tail heaviness
T	MEAN/STDERR, Student's t for H0: mean = 0
PRT	1 – 2 × PROBT(T,N–1), probability of (abs(T), N – 1), the absolute t under the null hypothesis..

Data Requirements for Univariate Statistics

Statistics are reported as missing if they cannot be computed. N and NMISS do not require any nonmissing observations. SUM, MEAN, MAX, MIN, RANGE, USS, and CSS require only one nonmissing observation. The requirements for other statistics are:

- VAR, STD, STDERR, CV, T, and PRT require at least 2 observations.
- SKEWNESS requires at least 3 observations.
- KURTOSIS requires at least 4 observations.
- SKEWNESS, KURTOSIS, T, and PRT require STD>0.
- CV requires MEAN≠0.

Statistics and Procedures Checklist

This table shows which procedures compute each statistic.

procedure	statistic: mean	sum	min	max	range	uss	css	var	std	stderr	cv	skewness	kurtosis	t	prt	median	quantile	mode
MEANS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
UNIVARIATE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SUMMARY	X	X	X	X	X	X	X	X	X	X	X			X	X			
TABULATE	X	X	X	X	X	X	X	X	X	X	X			X	X			
CHART	X	X																

BACKGROUND: UNIVARIATE CONTINUOUS DATA

Descriptive statistics for a sample can provide information about the distribution of a population: its location, variability, and shape. For example, data on students in a class for whom you have measures of height and weight (the sample) can be used to infer the height and weight distribution of all students in the school (the population).

Measures of Location

Measures of location include the mean, the mode, and the median.

Mean The mean of a variable is its expected value (called the *first moment*):

$$\text{mean}(x) = \mu = E(x) \quad .$$

The sample mean of a variable is the arithmetic average of all values of that variable in the sample, that is, the sum of all values x_i divided by the total number of values, n. The sample mean, (denoted $\bar{x}$) estimates the true mean:

$$\text{MEAN} = \bar{x} = \Sigma x_i / n \quad .$$

Mode The mode is the value at which the density of the distribution is at a maximum. Some distributions have more than one mode. The sample mode is the value that occurs most often in the sample. For a distribution with multiple modes, the common convention is to select the lowest mode for reporting. If the distribution is continuous, then all values occur once and the sample mode has little use.

Median The median is the value above and below which half the density falls. The sample median is the middle value when the measurements are arranged in ascending or descending order. For an even number of observations, the midpoint between the two middle values is usually reported as the median.

Measures of Variability

Another group of statistics important for studying a variable's distribution measures the *variability*, or spread, of values.

Range The simplest statistic in this category is the range, the difference between the highest and the lowest value, telling you nothing about the distribution of values between the maximum and minimum.

Variance A statistic that gives more information about the distribution is the variance. The variance is the expected value of the squared difference of the values from their mean:

$$\text{var}(x) = \sigma^2 = E(x - E(x))^2 \quad .$$

The sample variance is computed by first subtracting the sample mean from each value, squaring these differences, adding them up, and dividing the sum by the number of values minus 1. This sample variance, denoted s^2, is an unbiased estimate of the population variance σ^2:

$$\text{VAR}(x) = s^2 = \Sigma(x_i - \bar{x})^2/(n-1) \quad .$$

It is clear from this formula that when all the values lie close to the mean, the variance is small; when values are more scattered, the variance is large.

Standard Deviation The square root of the variance is the standard deviation, which is denoted σ. An estimate of the standard deviation is given by the sample standard deviation, which is the square root of the sample variance:

$$\text{STD}(x) = s = \sqrt{(s^2)} \quad .$$

This statistic s (keyword STD) is expressed in the same units as the observations themselves, rather than in the units squared.

Distributions and Tests

Normal distribution If your data have a normal distribution, you only need the mean and standard deviation to completely characterize the distribution of values. If your data are normally distributed, approximately two-thirds of the values in a sample fall within one standard deviation of the mean. Approximately 95% of the values fall within two standard deviations of the mean.

Distribution of the sample mean If many samples of size n are drawn from a population with mean μ and standard deviation σ, then these sample means together form a new distribution. The mean of the sample of means is still μ, but the standard deviation of the distribution of means is smaller than the standard deviation of the population. The standard deviation of the sample of means, the *standard error of the mean* (keyword STDERR), is calculated by

$$\sigma/\sqrt{n} \quad .$$

It is estimated in a sample by

$$s/\sqrt{n} \quad .$$

Testing hypotheses about the mean You can test the hypothesis that the mean in the population is some value by using the Student's *t* statistic. The test statistic for the null hypothesis that the mean is some value μ_0 is constructed:

$$t = (\bar{x} - \mu_0)/(s/n) \quad ,$$

which is the difference between the sample mean and the hypothesized mean divided by the standard error of the mean. This statistic has a Student's *t* distribution under the null hypothesis. Many SAS procedures print out the *t* statistic for the hypothesis that the mean is zero (keyword T, labeled T FOR H0:MEAN=0) and a two-tailed significance probability (keyword PRT, labeled PROB>|T|).

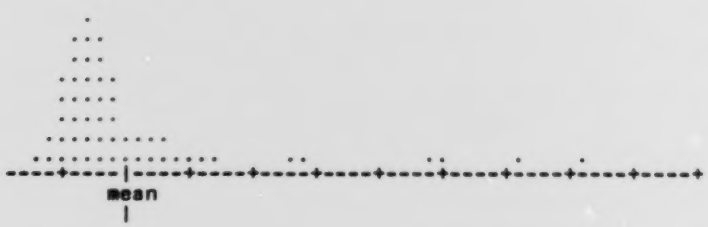
Coefficient of variation The coefficient of variation is a unitless measure of variation in the population. It is calculated by dividing the standard deviation by the mean and expressing the result as a percentage. The coefficient of variation is meaningful only for variables that are measured on at least a ratio scale.

Quantiles Percentiles are useful for studying the variability in large samples. For a set of measurements arranged in order of magnitude, the pth percentile is the value that has *p*% of the measurements below it and (100−*p*)% above it. The median is the 50th percentile. Since it may not be possible to divide your data so that you get exactly the desired percentile, a more precise definition is used (see the UNIVARIATE procedure).

The upper quartile of a distribution is the value below which 75% of the measurements fall (the 75th percentile). Twenty- five percent of the measurements fall below the lower quartile value. The interquartile range is the difference between the upper and lower quartiles. Selected percentiles and quartiles are calculated by the UNIVARIATE procedure. The RANK procedure can calculate any quantile statistic.

Measures of Shape

Skewness Sometimes a distribution is not symmetric; values are distributed differently below the mean than above the mean. For example, a few very large values may exert a disproportionate influence on the calculation of the mean compared to a larger number of values in the distribution close to the mean. A histogram of such data may look like this:



This distribution is said to be "skewed." Since the tail of values occurs in the values larger than the mean, the distribution is positively skewed, or skewed to the right. If the tail occurs in the smallest values, the distribution is negatively skewed, or skewed to the left. The statistic that measures skewness is calculated:

$$[n/(n-1)(n-2)]\,\Sigma_{i=1}^{n}(x_i - \bar{x})^3/s^3 \quad .$$

Kurtosis Another characteristic of a distribution, kurtosis is a measure of the extent of the heaviness of the tails of a distribution. The measure of kurtosis for a normally distributed population is zero. A heavy tailed distribution (like the double exponential) has positive kurtosis. Flat distributions with short tails (like the UNIFORM) have negative kurtosis. When almost all of the data values appear very close to the mean, the kurtosis is negative. SAS uses the formula below to measure kurtosis:

$$\text{Kurtosis} = [n(n+1)/(n-1)(n-2)(n-3)]\,\Sigma_{i=1}^{n}(x_i-\bar{x})^4/s^4 - 3(n-1)(n-1)/(n-2)(n-3) \quad .$$

These statistics for higher moments (skewness and kurtosis) are often avoided, since they are relatively unstable. Trust them only if you have a very large sample, or if the distribution is known to be well behaved. Procedures that calculate measures of the skewness and kurtosis of a distribution are UNIVARIATE and MEANS.

BACKGROUND: CATEGORICAL DATA

Count Data The basic statistics for categorical data are frequency counts and percentages. If a categorical variable can be considered a random response parameterized by the probabilities for each level occurring, then the frequency counts have a multinomial distribution. To estimate the response probabilities π_i, divide each count n_i by the total n

$$p_i = n_i/n \quad .$$

Distribution Though the counts n_i and the portions $p_i = n_i/n$ have a discrete distribution, a continuous normal approximation is used to approximate it in order to form test statistics. As n gets large, the distribution of $p_i = n_i/n$ approaches a normal distribution with mean π_i and variance $\pi_i(1-\pi_i)/n$ (Rao, 1965, p. 316–347).

Tests This normal approximation is used in the construction of test statistics. The most popular of these is a chi-square goodness-of-fit test for frequency counts (Pearson, 1900). This test is computed:

$$\chi^2 = \Sigma(n_i - n\pi_i)^2/n\pi_i = \Sigma(O-E)^2/E$$

where O is the observed count n_i, and E is the expected count $n\pi_i$.

For bivariate categorical distributions, this chi-square test is specialized to use the n multiplied by the product of the marginal probability estimates as the expected value under the hypothesis of independence.

See Chapter 16, "Introduction to SAS Categorical Procedures," in *SAS User's Guide: Statistics, 1982 Edition*, for discussion.

BACKGROUND: BIVARIATE MEASURES

Bivariate statistics measure how two variables relate to each other. Bivariate measures for continuous variables are available in PROC CORR. These include correlations, rank correlations, and measures of concordance. Bivariate measures for

categorical variables are available in PROC FREQ. These include chi-square tests of independence, and various measures of association. These measures are discussed in detail in the CORR and FREQ procedure descriptions.

REFERENCES

Pearson, K. (1900), *Phil. Mag. Ser. (5)*, 50, 157–172.
Rao, C.R. (1965), *Linear Statistical Inference and Its Application*, John Wiley & Sons.

	NUMBER OF SAMPLES	MEAN	ST. DEVIATION	MIN. VALUE	MAX. VALUE	RANGE OF VALUES	STANDARD ERROR OF THE MEAN
AU	146.00	3.06	4.82	0.10	30.00	29.90	0.40
LI	146.00	37.75	29.48	1.00	230.00	229.00	2.44
BE	146.00	5.32	2.87	1.00	10.00	9.00	0.24
B	146.00	59.90	34.16	1.00	180.00	179.00	2.83
NA2O	146.00	1.13	0.85	0.00	4.15	4.15	0.07
MGO	146.00	2.37	0.85	0.80	4.83	4.03	0.07
AL2O3	146.00	10.09	4.26	2.42	19.40	16.98	0.35
SIO2	146.00	32.45	11.26	7.08	60.00	52.92	0.93
P2O5	146.00	0.97	0.49	0.05	2.00	1.95	0.04
S	146.00	1216.20	1430.25	5.00	8700.00	8695.00	118.37
K2O	146.00	1.94	1.30	0.09	5.21	5.12	0.11
CAO	146.00	2.27	1.16	0.07	4.97	4.90	0.10
TIO2	146.00	0.43	0.17	0.10	0.83	0.73	0.01
V	146.00	50.42	42.96	1.00	310.00	309.00	3.56
CR	146.00	54.30	26.51	0.10	120.00	119.90	2.19
MNO	146.00	13.47	5.57	0.19	27.90	27.71	0.46
FE2O3	146.00	22.85	7.82	7.71	47.20	39.49	0.65
CO	146.00	101.77	36.31	21.00	220.00	199.00	3.01
NI	146.00	63.33	17.73	26.00	110.00	84.00	1.47
CU	146.00	56.60	50.65	1.00	410.00	409.00	4.19
ZN	146.00	77.28	23.46	29.00	130.00	101.00	1.94
GA	146.00	18.95	3.58	11.00	28.00	17.00	0.30

(CONTINUED)

	NUMBER OF SAMPLES	MEAN	ST. DEVIATION	MIN. VALUE	MAX. VALUE	RANGE OF VALUES	STANDARD ERROR OF THE MEAN
GD	146.00	6.14	1.53	0.10	10.20	10.10	0.13
DY	146.00	4.53	0.87	0.10	6.50	6.40	0.07
ER	146.00	2.32	0.52	0.10	5.40	5.30	0.04
LU	146.00	0.37	0.23	0.00	2.90	2.90	0.02
HF	146.00	1.62	1.12	0.10	4.00	3.90	0.09
TA	146.00	0.30	0.40	0.10	2.00	1.90	0.03
W	146.00	3.59	3.44	0.10	17.00	16.90	0.28
PT	146.00	2.97	4.50	1.00	20.00	19.00	0.37
TL	146.00	0.11	0.07	0.10	1.00	0.90	0.01
PB	146.00	10.74	12.67	0.10	130.00	129.90	1.05
BI	146.00	0.25	1.25	0.10	14.80	14.70	0.10
TH	146.00	4.84	3.02	0.10	14.00	13.90	0.25
U	146.00	1.70	1.29	0.10	14.30	14.20	0.11
LOI	146.00	11.56	5.22	0.80	25.60	24.80	0.43

(CONTINUED)

	NUMBER OF SAMPLES	MEAN	ST. DEVIATION	MIN. VALUE	MAX. VALUE	RANGE OF VALUES	STANDARD ERROR OF THE MEAN
GE	146.00	2.61	3.65	1.00	20.00	19.00	0.30
AS	146.00	34.67	63.73	0.10	300.00	299.90	5.27
SE	146.00	0.10	0.00	0.10	0.10	0.00	0.00
RB	146.00	62.53	57.76	1.00	211.00	210.00	4.78
SR	146.00	236.88	201.67	13.00	1800.00	1787.00	16.69
Y	146.00	10.94	9.92	1.00	32.00	31.00	0.82
ZR	146.00	48.05	38.82	1.00	155.00	154.00	3.21
NB	146.00	19.05	9.72	1.00	41.00	40.00	0.80
MO	146.00	9.60	4.52	0.10	33.00	32.90	0.37
PD	146.00	1.97	1.75	0.10	7.00	6.90	0.14
AG	146.00	0.10	0.00	0.10	0.10	0.00	0.00
CD	146.00	0.39	0.65	0.10	3.00	2.90	0.05
IN	146.00	0.10	0.00	0.10	0.10	0.00	0.00
SN	146.00	1.00	0.00	1.00	1.00	0.00	0.00
SB	146.00	2.37	3.09	0.20	28.00	27.80	0.26
CS	146.00	12.92	12.19	0.10	59.00	58.90	1.01
BA	146.00	1263.27	1398.87	100.00	9770.00	9670.00	115.77
LA	146.00	29.14	6.09	0.00	43.00	43.00	0.50
CE	146.00	74.87	13.07	0.10	113.00	112.90	1.08
ND	146.00	28.72	7.10	0.10	84.00	83.90	0.59
SM	146.00	5.34	2.13	0.10	28.00	27.90	0.18
EU	146.00	1.69	0.86	0.00	6.10	6.10	0.07

(CONTINUED)

	COEFFICIENT OF VARIATION	VARIANCE
AU	157.34	23.22
LI	78.09	868.89
BE	53.87	8.22
B	57.03	1166.92
NA2O	75.09	0.72
MGO	36.01	0.73
AL2O3	42.27	18.18
SIO2	34.72	126.87
P2O5	51.11	0.24
S	117.60	2045605.62
K2O	66.97	1.69
CAO	50.99	1.34
TIO2	40.19	0.03
V	85.19	1845.35
CR	48.83	702.96
MNO	41.33	31.00
FE2O3	34.22	61.13
CO	35.68	1318.39
NI	28.00	314.46
CU	89.49	2565.56
ZN	30.35	550.15
GA	18.87	12.78

(CONTINUED)

	COEFFICIENT OF VARIATION	VARIANCE
GE	139.69	13.29
AS	183.81	4061.53
SE	0.00	0.00
RB	92.36	3336.04
SR	85.14	40672.42
Y	90.69	98.40
ZR	80.79	1506.78
NB	51.01	94.47
MO	47.05	20.40
PD	88.63	3.05
AG	0.00	0.00
CD	163.64	0.42
IN	0.00	0.00
SN	0.00	0.00
SB	130.80	9.57
CS	94.38	148.65
BA	110.73	1956836.00
LA	20.91	37.13
CE	17.46	170.85
ND	24.73	50.47
SM	39.85	4.53
EU	50.81	0.74

(CONTINUED)

	COEFFICIENT OF VARIATION	VARIANCE
GD	24.84	2.33
DY	19.30	0.76
ER	22.47	0.27
LU	62.47	0.05
HF	68.79	1.25
TA	129.93	0.16
W	95.72	11.81
PT	151.42	20.26
TL	70.16	0.01
PB	117.99	160.65
BI	495.78	1.55
TH	62.44	9.15
U	75.88	1.67
LOI	45.13	27.24

OUTPUT DATASET FROM PROC CORR, WHOLE-ROCK ANALYSES
MARITIME RESOURCE RESEARCH LTD., D. PRINCE

RUN
22:33 THURSDAY, FEBRUARY 25, 1988

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
AU	146	3.06232877	4.81838634	447.1000000	0.10000000	30.00000000
LI	146	37.74657534	29.47700720	5511.0000000	1.00000000	230.00000000
BE	146	5.32191781	2.86701799	777.0000000	1.00000000	10.00000000
B	146	59.89726027	34.16021672	8745.0000000	1.00000000	180.00000000
NA2O	146	1.13082192	0.84912897	165.1000000	0.00000000	4.15000000
MGO	146	2.37075342	0.85377142	346.1300000	0.80000000	4.83000000
AL2O3	146	10.08835616	4.26415517	1472.9000000	2.42000000	19.40000000
SIO2	146	32.44602740	11.26378478	4737.1200000	7.08000000	60.00000000
P2O5	146	0.96698630	0.49425300	141.1800000	0.05000000	2.00000000
S	146	1216.19863014	1430.24669982	177565.0000000	5.00000000	8700.00000000
K2O	146	1.94130137	1.30008343	283.4300000	0.09000000	5.21000000
CAO	146	2.27034247	1.15767858	331.4700000	0.07000000	4.97000000
TIO2	146	0.43452055	0.17464479	63.4400000	0.10000000	0.83000000
V	146	50.42465753	42.95753085	7362.0000000	1.00000000	310.00000000
CR	146	54.29520548	26.51343012	7927.1000000	0.10000000	120.00000000
MNO	146	13.47369863	5.56815713	1967.1600000	0.19000000	27.90000000
FE2O3	146	22.84616438	7.81876445	3335.5400000	7.71000000	47.20000000
CO	146	101.76712329	36.30959617	14858.0000000	21.00000000	220.00000000
NI	146	63.32876712	17.73292655	9246.0000000	26.00000000	110.00000000
CU	146	56.60273973	50.65134092	8264.0000000	1.00000000	410.00000000
ZN	146	77.28082192	23.45523782	11283.0000000	29.00000000	130.00000000
GA	146	18.94520548	3.87535785	2766.0000000	11.00000000	28.00000000
GE	146	2.60958904	3.64525821	381.0000000	1.00000000	20.00000000
AS	146	34.67123288	63.73010544	5062.0000000	0.10000000	300.00000000
SE	146	0.10000000	0.00000000	14.6000000	0.10000000	0.10000000
RB	146	62.53424658	57.75849415	9130.0000000	1.00000000	211.00000000
SR	146	236.88356164	201.67404600	34585.0000000	13.00000000	1800.00000000
Y	146	10.93835616	9.91983218	1597.0000000	1.00000000	32.00000000
ZR	146	48.04794521	38.81722550	7015.0000000	1.00000000	155.00000000
NB	146	19.05479452	9.71935915	2782.0000000	1.00000000	41.00000000
MO	146	9.60000000	4.51640687	1401.6000000	0.10000000	33.00000000
PD	146	1.96986301	1.74598534	287.6000000	0.10000000	7.00000000
AG	146	0.10000000	0.00000000	14.6000000	0.10000000	0.10000000
CD	146	0.39452055	0.64559845	57.6000000	0.10000000	3.00000000
IN	146	0.10000000	0.00000000	14.6000000	0.10000000	0.10000000
SN	146	1.00000000	0.00000000	146.0000000	1.00000000	1.00000000
SB	146	2.36506849	3.09352143	345.3000000	0.20000000	28.00000000
CS	146	12.91849315	12.19226438	1886.1000000	0.10000000	59.00000000
BA	146	1263.26712329	1398.86954503	184437.0000000	100.00000000	9770.00000000
LA	146	29.13767123	6.09320866	4254.1000000	0.00000000	43.00000000
CE	146	74.87054795	13.07104285	10931.1000000	0.10000000	113.00000000
ND	146	28.72123288	7.10398828	4193.3000000	0.10000000	84.00000000
SM	146	5.34383562	2.12943161	780.2000000	0.10000000	28.00000000
EU	146	1.69246575	0.85999885	247.1000000	0.00000000	6.10000000
GD	146	6.14315068	1.52609068	896.9000000	0.10000000	10.20000000
DY	146	4.52945205	0.87424196	661.3000000	0.10000000	6.50000000
ER	146	2.31506849	0.52012498	338.0000000	0.10000000	5.40000000
LU	146	0.36917808	0.23061090	53.9000000	0.00000000	2.90000000
HF	146	1.62328767	1.11664776	237.0000000	0.10000000	4.00000000
TA	146	0.30410959	0.39512141	44.4000000	0.10000000	2.00000000
W	146	3.58972603	3.43625156	524.1000000	0.10000000	17.00000000
PT	146	2.97260274	4.50125684	434.0000000	1.00000000	20.00000000

D. PRINCE, AUTHOR

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
TL	146	0.10616438	0.07448453	15.5000000	0.10000000	1.00000000
PB	146	10.74178082	12.67468156	1568.3000000	0.10000000	130.00000000
BI	146	0.25136986	1.24624879	36.7000000	0.10000000	14.80000000
TH	146	4.84383562	3.02467947	707.2000000	0.10000000	14.00000000
U	146	1.70205479	1.29153580	248.5000000	0.10000000	14.30000000
LOI	146	11.56424658	5.21922148	1688.3800000	0.80000000	25.60000000

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	AU	LI	BE	B	NA2O	MGO	AL2O3	SIO2	P2O5	S	K2O	CAO	TIO2
AU	1.00000 0.0000	0.03782 0.6504	0.02699 0.7464	-0.05129 0.5387	-0.21191 0.0102	0.01335 0.8730	-0.11147 0.1804	-0.13611 0.1014	0.07981 0.3382	0.31822 0.0001	-0.05378 0.5191	0.18936 0.0221	-0.10862 0.1919
LI	0.03782 0.6504	1.00000 0.0000	-0.14714 0.0763	-0.12577 0.1304	-0.18147 0.0284	0.40695 0.0001	0.04973 0.5511	0.03014 0.7180	-0.10524 0.2061	0.12923 0.1200	-0.03052 0.7146	-0.19754 0.0169	0.05065 0.5438
BE	0.02699 0.7464	-0.14714 0.0763	1.00000 0.0000	-0.09282 0.2651	-0.42266 0.0001	-0.46109 0.0001	-0.47009 0.0001	-0.50762 0.0001	0.54768 0.0001	-0.07594 0.3623	-0.37366 0.0001	0.41198 0.0001	-0.46875 0.0001
B	-0.05129 0.5387	-0.12577 0.1304	-0.09282 0.2651	1.00000 0.0000	0.14775 0.0751	-0.05399 0.5175	0.21130 0.0105	0.20269 0.0141	-0.09690 0.2446	-0.07533 0.3661	0.29080 0.0004	-0.04313 0.6052	0.23781 0.0038
NA2O	-0.21191 0.0102	-0.18147 0.0284	-0.42266 0.0001	0.14775 0.0751	1.00000 0.0000	0.21038 0.0108	0.58418 0.0001	0.55443 0.0001	-0.55820 0.0001	-0.24230 0.0032	0.43719 0.0001	-0.43674 0.0001	0.60425 0.0001
MGO	0.01335 0.8730	0.40695 0.0001	-0.46109 0.0001	-0.05399 0.5175	0.21038 0.0108	1.00000 0.0000	0.57825 0.0001	0.58422 0.0001	-0.61599 0.0001	0.12190 0.1427	0.37128 0.0001	-0.59872 0.0001	0.57497 0.0001
AL2O3	-0.11147 0.1804	0.04973 0.5511	-0.47009 0.0001	0.21130 0.0105	0.58418 0.0001	0.57825 0.0001	1.00000 0.0000	0.97394 0.0001	-0.93589 0.0001	-0.06267 0.4524	0.90782 0.0001	-0.85936 0.0001	0.99135 0.0001
SIO2	-0.13611 0.1014	0.03014 0.7180	-0.50762 0.0001	0.20269 0.0141	0.55443 0.0001	0.58422 0.0001	0.97394 0.0001	1.00000 0.0000	-0.92343 0.0001	-0.05556 0.5054	0.89389 0.0001	-0.86082 0.0001	0.96363 0.0001
P2O5	0.07981 0.3382	-0.10524 0.2061	0.54768 0.0001	-0.09690 0.2446	-0.55820 0.0001	-0.61599 0.0001	-0.93589 0.0001	-0.92343 0.0001	1.00000 0.0000	0.05115 0.5398	-0.84641 0.0001	0.86515 0.0001	-0.93072 0.0001
S	0.31822 0.0001	0.12923 0.1200	-0.07594 0.3623	-0.07533 0.3661	-0.24230 0.0032	0.12190 0.1427	-0.06267 0.4524	-0.05556 0.5054	0.05115 0.5398	1.00000 0.0000	-0.10997 0.1864	0.02329 0.7802	-0.08035 0.3350
K2O	-0.05378 0.5191	-0.03052 0.7146	-0.37366 0.0001	0.29080 0.0004	0.43719 0.0001	0.37128 0.0001	0.90782 0.0001	0.89389 0.0001	-0.84641 0.0001	-0.10997 0.1864	1.00000 0.0000	-0.78062 0.0001	0.90340 0.0001
CAO	0.18936 0.0221	-0.19754 0.0169	0.41198 0.0001	-0.04313 0.6052	-0.43674 0.0001	-0.59872 0.0001	-0.85936 0.0001	-0.86082 0.0001	0.86515 0.0001	0.02329 0.7802	-0.78062 0.0001	1.00000 0.0000	-0.84646 0.0001
TIO2	-0.10862 0.1919	0.05065 0.5438	-0.46875 0.0001	0.23781 0.0038	0.60425 0.0001	0.57497 0.0001	0.99135 0.0001	0.96363 0.0001	-0.93072 0.0001	-0.08035 0.3350	0.90340 0.0001	-0.84646 0.0001	1.00000 0.0000
V	-0.07966 0.3392	0.00670 0.9361	-0.07694 0.3560	0.11743 0.1581	0.12409 0.1356	0.30453 0.0002	0.65517 0.0001	0.65206 0.0001	-0.56947 0.0001	-0.07670 0.3575	0.67291 0.0001	-0.59191 0.0001	0.63569 0.0001
CR	-0.10004 0.2296	0.00132 0.9874	-0.48751 0.0001	0.27647 0.0007	0.58770 0.0001	0.52418 0.0001	0.96666 0.0001	0.95290 0.0001	-0.90525 0.0001	-0.06807 0.4143	0.90302 0.0001	-0.80715 0.0001	0.97572 0.0001
MNO	0.08673 0.2979	-0.13114 0.1146	0.45006 0.0001	-0.13918 0.0938	-0.48288 0.0001	-0.56611 0.0001	-0.94730 0.0001	-0.95398 0.0001	0.87405 0.0001	-0.03197 0.7017	-0.87444 0.0001	0.84272 0.0001	-0.93258 0.0001

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	AU	LI	BE	B	NA2O	MGO	AL2O3	SIO2	P2O5	S	K2O	CAO	TIO2
FE2O3	0.03631 0.6635	-0.15171 0.0675	0.58166 0.0001	-0.11579 0.1640	-0.50924 0.0001	-0.63336 0.0001	-0.91407 0.0001	-0.91694 0.0001	0.95328 0.0001	0.02578 0.7574	-0.82349 0.0001	0.80873 0.0001	-0.91190 0.0001
CO	0.05475 0.5116	-0.12928 0.1199	0.21418 0.0094	-0.05936 0.4766	-0.24563 0.0028	-0.40963 0.0001	-0.70618 0.0001	-0.72829 0.0001	0.64257 0.0001	0.08109 0.3306	-0.64805 0.0001	0.60334 0.0001	-0.69151 0.0001
NI	-0.10242 0.2187	-0.02005 0.8101	-0.49491 0.0001	0.26870 0.0010	0.66169 0.0001	0.49214 0.0001	0.86603 0.0001	0.83616 0.0001	-0.82628 0.0001	-0.06304 0.4497	0.78265 0.0001	-0.72684 0.0001	0.89352 0.0001
CU	-0.10681 0.1994	-0.01073 0.8977	-0.17032 0.0398	0.04691 0.5739	0.16071 0.0526	0.13774 0.0973	0.29647 0.0003	0.27562 0.0008	-0.24281 0.0031	0.09822 0.2382	0.25925 0.0016	-0.29421 0.0003	0.27195 0.0009
ZN	-0.10441 0.2098	0.09094 0.2750	-0.50234 0.0001	0.22759 0.0057	0.54905 0.0001	0.63697 0.0001	0.91563 0.0001	0.89337 0.0001	-0.84581 0.0001	0.06460 0.4386	0.79620 0.0001	-0.76967 0.0001	0.89714 0.0001
GA	-0.22610 0.0061	-0.09260 0.2663	-0.45240 0.0001	0.31171 0.0001	0.45257 0.0001	0.22066 0.0074	0.35890 0.0001	0.30837 0.0002	-0.33381 0.0001	0.05708 0.4938	0.30503 0.0002	-0.27827 0.0007	0.35129 0.0001
GE	-0.03693 0.6581	-0.08058 0.3336	0.43444 0.0001	0.03340 0.6890	-0.12146 0.1442	-0.07879 0.3445	-0.03841 0.6453	-0.03741 0.6539	0.04141 0.6197	-0.17505 0.0346	-0.01532 0.8544	0.01891 0.8208	-0.03382 0.6853
AS	0.07810 0.3488	-0.11882 0.1532	0.55686 0.0001	0.01093 0.8958	-0.28101 0.0006	-0.26323 0.0013	-0.23768 0.0039	-0.25280 0.0021	0.22902 0.0054	-0.02792 0.7380	-0.20439 0.0133	0.19143 0.0206	-0.23447 0.0044
SE	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
RB	-0.18279 0.0272	-0.03221 0.6995	-0.38470 0.0001	0.28959 0.0004	0.44016 0.0001	0.30282 0.0002	0.72871 0.0001	0.73096 0.0001	-0.65111 0.0001	-0.15056 0.0697	0.76893 0.0001	-0.68524 0.0001	0.71843 0.0001
SR	-0.08401 0.3134	-0.18909 0.0223	0.01216 0.8842	0.15397 0.0635	0.28015 0.0006	-0.19490 0.0184	-0.20849 0.0116	-0.18557 0.0249	0.25401 0.0020	-0.09875 0.2357	-0.18171 0.0282	0.32000 0.0001	-0.18198 0.0279
Y	-0.18230 0.0276	0.01450 0.8621	-0.22554 0.0062	0.12217 0.1418	0.34638 0.0001	0.24847 0.0025	0.36422 0.0001	0.36795 0.0001	-0.28482 0.0005	0.03419 0.6820	0.27866 0.0007	-0.37231 0.0001	0.35983 0.0001
ZR	-0.05460 0.5127	0.07668 0.3576	-0.38255 0.0001	0.13453 0.1055	0.49802 0.0001	0.53385 0.0001	0.92720 0.0001	0.88739 0.0001	-0.88155 0.0001	-0.04653 0.5770	0.84796 0.0001	-0.82885 0.0001	0.92308 0.0001
NB	-0.10344 0.2141	0.07479 0.3696	0.06223 0.4556	-0.01108 0.8945	-0.07120 0.3931	0.16990 0.0403	0.07797 0.3496	0.10470 0.2085	-0.06901 0.4079	-0.03778 0.6507	0.02298 0.7831	-0.14957 0.0716	0.07006 0.4007
MO	0.14438 0.0821	-0.03344 0.6886	0.31754 0.0001	-0.11502 0.1669	-0.41875 0.0001	-0.43129 0.0001	-0.79778 0.0001	-0.80953 0.0001	0.73315 0.0001	0.10247 0.2184	-0.73261 0.0001	0.69231 0.0001	-0.79177 0.0001
PD	0.16544 0.0460	0.13713 0.0988	0.23933 0.0036	-0.11995 0.1493	-0.16707 0.0439	-0.06828 0.4128	-0.08330 0.3175	-0.11450 0.1688	0.08521 0.3065	0.18590 0.0247	-0.10154 0.2226	0.05553 0.5056	-0.06937 0.4054
AG	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	AU	LI	BE	B	NA2O	MGO	AL2O3	SIO2	P2O5	S	K2O	CAO	TIO2
CD	0.13125 0.1143	-0.03928 0.6378	0.43913 0.0001	-0.07495 0.3686	-0.14652 0.0776	-0.12316 0.1386	-0.10071 0.2265	-0.11594 0.1634	0.07389 0.3754	-0.07300 0.3812	-0.06847 0.4115	0.13130 0.1142	-0.09330 0.2627
IN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SB	0.11267 0.1757	-0.09914 0.2339	0.02157 0.7961	0.06151 0.4608	0.12893 0.1209	-0.16833 0.0423	0.06243 0.4541	0.04425 0.5959	-0.03957 0.6353	-0.06625 0.4269	0.08024 0.3356	0.06049 0.4683	0.08674 0.2979
CS	-0.19161 0.0205	-0.32142 0.0001	0.00569 0.9457	0.40686 0.0001	0.25005 0.0023	-0.18670 0.0240	-0.09751 0.2416	-0.07437 0.3723	0.21673 0.0086	-0.15078 0.0693	-0.02665 0.7495	0.14931 0.0721	-0.08138 0.3288
BA	-0.12117 0.1451	-0.20370 0.0137	-0.12494 0.1329	0.27269 0.0009	0.47669 0.0001	-0.07200 0.3878	0.16000 0.0537	0.17219 0.0377	-0.12701 0.1266	-0.15692 0.0586	0.22010 0.0076	0.04539 0.5865	0.22076 0.0074
LA	-0.11445 0.1689	-0.03217 0.6999	-0.32450 0.0001	0.25036 0.0023	0.41474 0.0001	0.44042 0.0001	0.66960 0.0001	0.64407 0.0001	-0.55833 0.0001	0.09553 0.2514	0.54879 0.0001	-0.59371 0.0001	0.65467 0.0001
CE	-0.03415 0.6823	-0.03910 0.6394	-0.16386 0.0481	0.22910 0.0054	0.23296 0.0047	0.23881 0.0037	0.35486 0.0001	0.32044 0.0001	-0.21736 0.0084	0.20311 0.0139	0.24526 0.0028	-0.31173 0.0001	0.34091 0.0001
ND	0.09887 0.2351	0.17307 0.0367	-0.12231 0.1414	0.10987 0.1868	0.22145 0.0072	0.26404 0.0013	0.40546 0.0001	0.35361 0.0001	-0.27881 0.0007	0.08045 0.3344	0.30959 0.0001	-0.32953 0.0001	0.39380 0.0001
SM	0.20782 0.0118	0.21945 0.0078	0.03540 0.6714	-0.01028 0.9020	-0.01018 0.9029	0.10896 0.1905	0.10903 0.1902	0.06702 0.4215	-0.01843 0.8252	0.07101 0.3944	0.05963 0.4746	-0.05673 0.4964	0.10541 0.2054
EU	-0.06143 0.4614	-0.04945 0.5533	-0.08320 0.3181	0.22675 0.0059	0.27019 0.0010	-0.09061 0.2767	-0.01825 0.8269	-0.02122 0.7993	0.10627 0.2017	-0.01115 0.8937	0.02539 0.7610	0.14766 0.0753	0.01878 0.8220
GD	-0.03473 0.6773	0.02182 0.7938	-0.06246 0.4539	0.15648 0.0593	0.00933 0.9110	0.08759 0.2931	-0.08699 0.2965	-0.10916 0.1897	0.20163 0.0147	0.32034 0.0001	-0.16508 0.0465	0.07298 0.3814	-0.11666 0.1608
DY	0.11562 0.1646	0.08170 0.3269	0.16403 0.0479	0.02239 0.7885	-0.12808 0.1234	-0.06768 0.4170	-0.30011 0.0002	-0.32069 0.0001	0.41809 0.0001	0.25607 0.0018	-0.38825 0.0001	0.27077 0.0009	-0.31070 0.0001
ER	0.18592 0.0247	0.12912 0.1203	0.14472 0.0814	0.01103 0.8948	-0.12194 0.1426	0.06120 0.4631	-0.16054 0.0529	-0.18420 0.0260	0.26781 0.0011	0.19805 0.0166	-0.23781 0.0038	0.16495 0.0466	-0.15564 0.0607
LU	0.18465 0.0257	0.19668 0.0173	0.00364 0.9653	0.00704 0.9328	0.03817 0.6474	0.02026 0.8082	0.01719 0.8369	-0.03042 0.7155	0.03331 0.6898	0.04859 0.5603	-0.02034 0.8075	0.01880 0.8218	0.02934 0.7252
HF	-0.05811 0.4860	0.02566 0.7585	-0.37008 0.0001	0.18218 0.0277	0.49222 0.0001	0.52861 0.0001	0.84187 0.0001	0.81999 0.0001	-0.78810 0.0001	0.00420 0.9599	0.75512 0.0001	-0.71677 0.0001	0.83366 0.0001
TA	-0.14145 0.0886	0.12556 0.1310	-0.29096 0.0004	0.08485 0.3086	0.32954 0.0001	0.35618 0.0001	0.65329 0.0001	0.64376 0.0001	-0.61843 0.0001	-0.10458 0.2091	0.62430 0.0001	-0.61714 0.0001	0.63366 0.0001

OUTPUT DATASET FROM PROC CORR, WHOLE-ROCK ANALYSES
MARITIME RESOURCE RESEARCH LTD., D. PRINCE

RUN
22:33 THURSDAY, FEBRUARY 25, 1988

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	AU	LI	BE	B	NA2O	MGO	AL2O3	SIO2	P2O5	S	K2O	CAO	TIO2
W	0.09615 0.2483	-0.27736 0.0007	0.31199 0.0001	-0.02473 0.7670	-0.02193 0.7928	-0.39110 0.0001	-0.32065 0.0001	-0.37025 0.0001	0.40323 0.0001	-0.00810 0.9227	-0.20794 0.0118	0.38615 0.0001	-0.30285 0.0002
PT	-0.04444 0.5943	-0.00073 0.9930	0.17063 0.0395	0.04613 0.5803	-0.05003 0.5487	-0.12454 0.1342	-0.11335 0.1731	-0.12141 0.1443	0.11996 0.1492	-0.08162 0.3274	-0.13316 0.1091	0.14243 0.0864	-0.10634 0.2014
TL	0.18916 0.0222	0.17599 0.0336	0.13597 0.1017	-0.09733 0.2425	-0.08644 0.2995	-0.08401 0.3134	-0.09064 0.2766	-0.12315 0.1386	0.11684 0.1602	-0.04872 0.5592	-0.08597 0.3022	0.11300 0.1745	-0.08327 0.3177
PB	0.03967 0.6345	-0.01142 0.8912	-0.18130 0.0285	0.05332 0.5227	0.34678 0.0001	0.22382 0.0066	0.33061 0.0001	0.31698 0.0001	-0.30584 0.0002	0.06079 0.4661	0.21570 0.0089	-0.24225 0.0032	0.31209 0.0001
BI	-0.03795 0.6492	-0.04322 0.6045	-0.05388 0.5183	-0.05892 0.4799	0.01740 0.8349	-0.05262 0.5282	-0.06774 0.4166	-0.05289 0.5261	0.05823 0.4851	-0.07391 0.3753	-0.04722 0.5714	0.02447 0.7694	-0.07902 0.3431
TH	-0.20563 0.0128	0.05939 0.4764	-0.56398 0.0001	0.25103 0.0022	0.64740 0.0001	0.47407 0.0001	0.81184 0.0001	0.77412 0.0001	-0.75582 0.0001	0.00274 0.9738	0.69751 0.0001	-0.71290 0.0001	0.79741 0.0001
U	-0.09740 0.2422	0.22897 0.0054	-0.28291 0.0005	0.09525 0.2528	0.11848 0.1544	0.23286 0.0047	0.23047 0.0051	0.20008 0.0155	-0.26177 0.0014	0.14193 0.0875	0.21052 0.0108	-0.28340 0.0005	0.21081 0.0106
LOI	0.18868 0.0226	0.24910 0.0024	0.23325 0.0046	-0.35995 0.0001	-0.61678 0.0001	-0.28426 0.0005	-0.73013 0.0001	-0.73459 0.0001	0.55904 0.0001	0.23073 0.0051	-0.68109 0.0001	0.53264 0.0001	-0.72954 0.0001

	V	CR	MNO	FE2O3	CO	NI	CU	ZN	GA	GE	AS	SE	RB
AU	-0.07966 0.3392	-0.10004 0.2296	0.08673 0.2979	0.03631 0.6635	0.05475 0.5116	-0.10242 0.2187	-0.10681 0.1994	-0.10441 0.2098	-0.22610 0.0061	-0.03693 0.6581	0.07810 0.3488	0.00000 1.0000	-0.18279 0.0272
LI	0.00670 0.9361	0.00132 0.9874	-0.13114 0.1146	-0.15171 0.0675	-0.12928 0.1199	-0.02005 0.8101	-0.01073 0.8977	0.09094 0.2750	-0.09260 0.2663	-0.08058 0.3336	-0.11882 0.1532	0.00000 1.0000	-0.03221 0.6995
BE	-0.07694 0.3560	-0.48751 0.0001	0.45006 0.0001	0.58166 0.0001	0.21418 0.0094	-0.49491 0.0001	-0.17032 0.0398	-0.50234 0.0001	-0.45240 0.0001	0.43444 0.0001	0.55686 0.0001	0.00000 1.0000	-0.38470 0.0001
B	0.11743 0.1581	0.27647 0.0007	-0.13918 0.0938	-0.11579 0.1640	-0.05936 0.4766	0.26870 0.0010	0.04691 0.5739	0.22759 0.0057	0.31171 0.0001	0.03340 0.6890	0.01093 0.8958	0.00000 1.0000	0.28959 0.0004
NA2O	0.12409 0.1356	0.58770 0.0001	-0.48288 0.0001	-0.50924 0.0001	-0.24563 0.0028	0.66169 0.0001	0.16071 0.0526	0.54905 0.0001	0.45257 0.0001	-0.12146 0.1442	-0.28101 0.0006	0.00000 1.0000	0.44016 0.0001
MGO	0.30453 0.0002	0.52418 0.0001	-0.56611 0.0001	-0.63336 0.0001	-0.40963 0.0001	0.49214 0.0001	0.13774 0.0973	0.63697 0.0001	0.22066 0.0074	-0.07879 0.3445	-0.26323 0.0013	0.00000 1.0000	0.30282 0.0002
AL2O3	0.65517 0.0001	0.96666 0.0001	-0.94730 0.0001	-0.91407 0.0001	-0.70618 0.0001	0.86603 0.0001	0.29647 0.0003	0.91563 0.0001	0.35890 0.0001	-0.03841 0.6453	-0.23768 0.0039	0.00000 1.0000	0.72871 0.0001
SIO2	0.65206 0.0001	0.95290 0.0001	-0.95398 0.0001	-0.91694 0.0001	-0.72829 0.0001	0.83616 0.0001	0.27562 0.0008	0.89337 0.0001	0.30837 0.0002	-0.03741 0.6539	-0.25280 0.0021	0.00000 1.0000	0.73096 0.0001

D. PRINCE, AUTHOR

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	V	CR	MNO	FE2O3	CO	NI	CU	ZN	GA	GE	AS	SE	RB
P2O5	-0.56947 0.0001	-0.90525 0.0001	0.87405 0.0001	0.95328 0.0001	0.64257 0.0001	-0.82628 0.0001	-0.24281 0.0031	-0.84581 0.0001	-0.33381 0.0001	0.04141 0.6197	0.22902 0.0054	0.00000 1.0000	-0.65111 0.0001
S	-0.07670 0.3575	-0.06807 0.4143	-0.03197 0.7017	0.02578 0.7574	0.08109 0.3306	-0.06304 0.4497	0.09822 0.2382	0.06460 0.4386	0.05708 0.4938	-0.17505 0.0346	-0.02792 0.7380	0.00000 1.0000	-0.15056 0.0697
K2O	0.67291 0.0001	0.90302 0.0001	-0.87444 0.0001	-0.82349 0.0001	-0.64805 0.0001	0.78265 0.0001	0.25925 0.0016	0.79620 0.0001	0.30503 0.0002	-0.01532 0.8544	-0.20439 0.0133	0.00000 1.0000	0.76893 0.0001
CAO	-0.59191 0.0001	-0.80715 0.0001	0.84272 0.0001	0.80873 0.0001	0.60334 0.0001	-0.72684 0.0001	-0.29421 0.0003	-0.76967 0.0001	-0.27827 0.0007	0.01891 0.8208	0.19143 0.0206	0.00000 1.0000	-0.68524 0.0001
TIO2	0.63569 0.0001	0.97572 0.0001	-0.93258 0.0001	-0.91190 0.0001	-0.69151 0.0001	0.89352 0.0001	0.27195 0.0009	0.89714 0.0001	0.35129 0.0001	-0.03382 0.6853	-0.23447 0.0044	0.00000 1.0000	0.71843 0.0001
V	1.00000 0.0000	0.59995 0.0001	-0.68076 0.0001	-0.56316 0.0001	-0.55075 0.0001	0.45843 0.0001	0.43685 0.0001	0.54954 0.0001	0.02013 0.8094	0.24840 0.0025	0.20244 0.0143	0.00000 1.0000	0.56246 0.0001
CR	0.59995 0.0001	1.00000 0.0000	-0.92255 0.0001	-0.89392 0.0001	-0.68921 0.0001	0.89754 0.0001	0.26405 0.0013	0.87189 0.0001	0.34580 0.0001	-0.06903 0.4077	-0.28030 0.0006	0.00000 1.0000	0.71802 0.0001
MNO	-0.68076 0.0001	-0.92255 0.0001	1.00000 0.0000	0.84482 0.0001	0.72991 0.0001	-0.77076 0.0001	-0.27918 0.0006	-0.87273 0.0001	-0.23512 0.0043	0.06617 0.4275	0.23300 0.0047	0.00000 1.0000	-0.71447 0.0001
FE2O3	-0.56316 0.0001	-0.89392 0.0001	0.84482 0.0001	1.00000 0.0000	0.69096 0.0001	-0.81576 0.0001	-0.24109 0.0034	-0.82644 0.0001	-0.31292 0.0001	0.03872 0.6427	0.22480 0.0064	0.00000 1.0000	-0.61656 0.0001
CO	-0.55075 0.0001	-0.68921 0.0001	0.72991 0.0001	0.69096 0.0001	1.00000 0.0000	-0.54520 0.0001	-0.11940 0.1512	-0.55753 0.0001	0.11932 0.1514	-0.11459 0.1684	0.10343 0.2141	0.00000 1.0000	-0.40353 0.0001
NI	0.45843 0.0001	0.89754 0.0001	-0.77076 0.0001	-0.81576 0.0001	-0.54520 0.0001	1.00000 0.0000	0.27371 0.0008	0.81467 0.0001	0.41407 0.0001	-0.10842 0.1927	-0.29258 0.0003	0.00000 1.0000	0.62349 0.0001
CU	0.43685 0.0001	0.26405 0.0013	-0.27918 0.0006	-0.24109 0.0034	-0.11940 0.1512	0.27371 0.0008	1.00000 0.0000	0.32795 0.0001	0.22944 0.0053	-0.12921 0.1201	-0.02708 0.7456	0.00000 1.0000	0.21153 0.0104
ZN	0.54954 0.0001	0.87189 0.0001	-0.87273 0.0001	-0.82644 0.0001	-0.55753 0.0001	0.81467 0.0001	0.32795 0.0001	1.00000 0.0000	0.52133 0.0001	-0.14704 0.0765	-0.31627 0.0001	0.00000 1.0000	0.67648 0.0001
GA	0.02013 0.8094	0.34580 0.0001	-0.23512 0.0043	-0.31292 0.0001	0.11932 0.1514	0.41407 0.0001	0.22944 0.0053	0.52133 0.0001	1.00000 0.0000	-0.29957 0.0002	-0.33636 0.0001	0.00000 1.0000	0.48068 0.0001
GE	0.24840 0.0025	-0.06903 0.4077	0.06617 0.4275	0.03872 0.6427	-0.11459 0.1684	-0.10842 0.1927	-0.12921 0.1201	-0.14704 0.0765	-0.29957 0.0002	1.00000 0.0000	0.65598 0.0001	0.00000 1.0000	-0.15852 0.0560
AS	0.20244 0.0143	-0.28030 0.0006	0.23300 0.0047	0.22480 0.0064	0.10343 0.2141	-0.29258 0.0003	-0.02708 0.7456	-0.31627 0.0001	-0.33636 0.0001	0.65598 0.0001	1.00000 0.0000	0.00000 1.0000	-0.22895 0.0054
SE	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	V	CR	MNO	FE2O3	CO	NI	CU	ZN	GA	GE	AS	SE	RB
RB	0.56246 0.0001	0.71802 0.0001	-0.71447 0.0001	-0.61656 0.0001	-0.40353 0.0001	0.62349 0.0001	0.21153 0.0104	0.67648 0.0001	0.48068 0.0001	-0.15852 0.0560	-0.22896 0.0054	0.00000 1.0000	1.00000 0.0000
SR	-0.21223 0.0101	-0.17698 0.0326	0.23933 0.0036	0.23148 0.0049	0.35889 0.0001	-0.08862 0.2875	0.29157 0.0004	-0.13789 0.0970	0.16373 0.0483	-0.14824 0.0742	-0.08491 0.3082	0.00000 1.0000	-0.08939 0.2833
Y	0.25027 0.0023	0.34420 0.0001	-0.38646 0.0001	-0.27587 0.0008	-0.15906 0.0552	0.32627 0.0001	0.13362 0.1079	0.44955 0.0001	0.43061 0.0001	-0.18624 0.0244	-0.17610 0.0335	0.00000 1.0000	0.51167 0.0001
ZR	0.64025 0.0001	0.68951 0.0001	-0.67915 0.0001	-0.65042 0.0001	-0.69059 0.0001	0.81874 0.0001	0.22841 0.0056	0.82469 0.0001	0.25062 0.0023	-0.00635 0.9394	-0.14324 0.0846	0.00000 1.0000	0.64221 0.0001
NB	0.16023 0.0534	0.05935 0.4767	-0.10820 0.1936	-0.07089 0.3952	-0.14274 0.0857	0.00350 0.9666	0.06480 0.4371	0.04286 0.6075	-0.06977 0.4027	0.11604 0.1631	0.06308 0.4494	0.00000 1.0000	-0.04885 0.5582
MO	-0.59072 0.0001	-0.77772 0.0001	0.80166 0.0001	0.71914 0.0001	0.69494 0.0001	-0.66373 0.0001	-0.15814 0.0566	-0.68291 0.0001	-0.08561 0.2986	-0.02685 0.7477	0.14994 0.0709	0.00000 1.0000	-0.57265 0.0001
PD	0.07126 0.3927	-0.10213 0.2200	0.06211 0.4564	0.04638 0.5783	-0.07621 0.3606	-0.07851 0.3462	0.04665 0.5751	-0.15818 0.0565	-0.33910 0.0001	0.32777 0.0001	0.39716 0.0001	0.00000 1.0000	-0.28172 0.0006
AG	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
CD	0.13795 0.0968	-0.11825 0.1552	0.10707 0.1983	0.07028 0.3992	-0.04716 0.5719	-0.14213 0.0870	-0.11578 0.1640	-0.20097 0.0150	-0.32909 0.0001	0.64936 0.0001	0.70734 0.0001	0.00000 1.0000	-0.25944 0.0016
IN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SB	-0.13339 0.1085	0.11823 0.1552	-0.01342 0.8723	-0.04222 0.6129	-0.10851 0.1923	0.07003 0.4009	-0.09204 0.2692	-0.10000 0.2298	-0.17913 0.0305	-0.02440 0.7701	0.04583 0.5828	0.00000 1.0000	-0.08540 0.3054
CS	-0.16434 0.0475	-0.06297 0.4502	0.15136 0.0682	0.26574 0.0012	0.33183 0.0001	0.04423 0.5960	0.00974 0.9071	0.00063 0.9940	0.34218 0.0001	-0.21287 0.0099	-0.16704 0.0439	0.00000 1.0000	0.18004 0.0297
BA	-0.04021 0.6299	0.20240 0.0143	-0.08698 0.2965	-0.15444 0.0627	0.01233 0.8825	0.31693 0.0001	0.01403 0.8666	0.17030 0.0399	0.27036 0.0010	-0.05752 0.4904	-0.13993 0.0921	0.00000 1.0000	0.12089 0.1461
LA	0.50866 0.0001	0.61870 0.0001	-0.63885 0.0001	-0.55864 0.0001	-0.33881 0.0001	0.58394 0.0001	0.29394 0.0003	0.71130 0.0001	0.47526 0.0001	-0.02340 0.7792	-0.08932 0.2837	0.00000 1.0000	0.55710 0.0001
CE	0.28440 0.0005	0.31073 0.0001	-0.33467 0.0001	-0.24264 0.0032	-0.06039 0.4690	0.31651 0.0001	0.28465 0.0005	0.46713 0.0001	0.44407 0.0001	-0.05957 0.4751	-0.03353 0.6879	0.00000 1.0000	0.31363 0.0001
ND	0.32470 0.0001	0.36280 0.0001	-0.37673 0.0001	-0.31274 0.0001	-0.20018 0.0154	0.32762 0.0001	0.27015 0.0010	0.46149 0.0001	0.31211 0.0001	-0.08442 0.3110	-0.12031 0.1480	0.00000 1.0000	0.33331 0.0001

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	V	CR	MNO	FE2O3	CO	NI	CU	ZN	GA	GE	AS	SE	BB
SM	0.10545	0.09432	-0.09910	-0.06863	-0.07143	0.07169	0.14660	0.15537	0.07188	-0.05882	-0.06708	0.00000	0.05257
	0.2052	0.2575	0.2340	0.4105	0.3916	0.3899	0.0775	0.0611	0.3886	0.4807	0.4211	1.0000	0.5286
EU	-0.15379	0.00685	0.06282	0.05912	0.22102	0.08912	0.09586	0.11078	0.45518	-0.22292	-0.19698	0.00000	0.14220
	0.0638	0.9346	0.4513	0.4784	0.0073	0.2848	0.2497	0.1831	0.0001	0.0068	0.0172	1.0000	0.0869
GD	-0.12256	-0.13553	0.07115	0.17873	0.34288	-0.10239	0.15336	0.16439	0.47948	-0.24130	-0.13054	0.00000	0.07157
	0.1405	0.1029	0.3935	0.0309	0.0001	0.2188	0.0646	0.0474	0.0001	0.0033	0.1163	1.0000	0.3906
DY	-0.19292	-0.32061	0.29010	0.35205	0.35817	-0.23138	0.08276	-0.11069	0.15629	-0.08553	0.06359	0.00000	-0.20882
	0.0197	0.0001	0.0004	0.0001	0.0001	0.0050	0.3207	0.1835	0.0596	0.3047	0.4457	1.0000	0.0114
ER	-0.09381	-0.14862	0.15231	0.20871	0.16233	-0.10096	0.07951	-0.03223	0.03827	-0.03980	0.03684	0.00000	-0.17766
	0.2600	0.0734	0.0665	0.0115	0.0503	0.2253	0.3401	0.6993	0.6465	0.6334	0.6589	1.0000	0.0319
LU	-0.06843	0.03307	0.00973	0.00578	0.04559	0.05427	0.05007	0.06778	0.14766	-0.15634	-0.16623	0.00000	0.02972
	0.4118	0.6919	0.9072	0.9448	0.5848	0.5153	0.5484	0.4163	0.0753	0.0595	0.0449	1.0000	0.7217
HF	0.54899	0.81054	-0.80615	-0.77153	-0.56450	0.73944	0.26380	0.77592	0.32404	-0.02554	-0.17533	0.00000	0.57638
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0013	0.0001	0.0001	0.7596	0.0343	1.0000	0.0001
TA	0.47878	0.63475	-0.64845	-0.59423	-0.50266	0.48742	0.15508	0.59624	0.28672	0.00304	-0.17604	0.00000	0.58586
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0616	0.0001	0.0005	0.9710	0.0335	1.0000	0.0001
W	-0.24343	-0.28687	0.31704	0.47160	0.33110	-0.23825	-0.06810	-0.30254	-0.01560	-0.06821	-0.05628	0.00000	-0.14660
	0.0031	0.0004	0.0001	0.0001	0.0001	0.0038	0.4141	0.0002	0.8518	0.4133	0.4999	1.0000	0.0774
PT	0.07514	-0.14591	0.12960	0.09556	0.01131	-0.12767	-0.09385	-0.14122	-0.20279	0.37300	0.38198	0.00000	-0.18921
	0.3674	0.0789	0.1190	0.2512	0.8922	0.1246	0.2599	0.0891	0.0141	0.0001	0.0001	1.0000	0.0222
TL	-0.05902	-0.08265	0.10366	0.09223	0.02119	-0.10023	-0.00264	-0.10403	-0.09195	-0.03680	-0.04141	0.00000	-0.08878
	0.4792	0.3213	0.2131	0.2682	0.7996	0.2287	0.9748	0.2115	0.2697	0.6593	0.6197	1.0000	0.2866
PB	0.22353	0.29777	-0.31313	-0.27762	-0.21909	0.25847	0.10585	0.36583	0.14451	-0.11816	-0.07271	0.00000	0.19844
	0.0067	0.0003	0.0001	0.0007	0.0079	0.0016	0.2035	0.0001	0.0818	0.1555	0.3831	1.0000	0.0163
BI	-0.06923	-0.07976	0.10065	0.04649	0.04981	-0.08709	-0.00096	-0.05292	0.01549	-0.05400	-0.05346	0.00000	0.01952
	0.4064	0.3386	0.2267	0.5774	0.5504	0.2959	0.9908	0.5258	0.8527	0.5174	0.5216	1.0000	0.8151
TH	0.35794	0.78462	-0.75671	-0.72311	-0.41800	0.72839	0.27668	0.84842	0.68922	-0.27566	-0.39457	0.00000	0.75384
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0007	0.0001	0.0001	0.0008	0.0001	1.0000	0.0001
U	0.13894	0.18196	-0.24240	-0.24051	-0.00696	0.17077	0.15697	0.28667	0.28036	-0.13416	-0.15742	0.00000	0.23440
	0.0944	0.0279	0.0032	0.0035	0.9335	0.0393	0.0585	0.0005	0.0006	0.1064	0.0578	1.0000	0.0044
LOI	-0.43483	-0.72218	0.65767	0.50008	0.44441	-0.66683	-0.21347	-0.69127	-0.35089	0.03083	0.27157	0.00000	-0.60721
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0097	0.0001	0.0001	0.7118	0.0009	1.0000	0.0001

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	SR	Y	ZR	NB	MO	PD	AG	CD	IN	SN	SB	CS	BA
AU	-0.08401 0.3134	-0.10230 0.0276	-0.05460 0.5127	-0.10344 0.2141	0.14438 0.0821	0.16544 0.0460	0.00000 1.0000	0.13125 0.1143	0.00000 1.0000	0.00000 1.0000	0.11267 0.1757	-0.19161 0.0205	-0.12117 0.1451
LI	-0.18909 0.0223	0.01450 0.8621	0.07668 0.3576	0.07479 0.3696	-0.03344 0.6886	0.13713 0.0988	0.00000 1.0000	-0.03928 0.6378	0.00000 1.0000	0.00000 1.0000	-0.09914 0.2339	-0.32142 0.0001	-0.20370 0.0137
BE	0.01216 0.8842	-0.22554 0.0062	-0.38255 0.0001	0.06223 0.4556	0.31754 0.0001	0.23933 0.0036	0.00000 1.0000	0.43913 0.0001	0.00000 1.0000	0.00000 1.0000	0.02157 0.7961	0.00569 0.9457	-0.12494 0.1329
B	0.15397 0.0635	0.12217 0.1418	0.13453 0.1055	-0.01108 0.8945	-0.11502 0.1669	-0.11995 0.1493	0.00000 1.0000	-0.07495 0.3686	0.00000 1.0000	0.00000 1.0000	0.06151 0.4608	0.40686 0.0001	0.27269 0.0009
NA2O	0.28015 0.0006	0.34638 0.0001	0.49802 0.0001	-0.07120 0.3931	-0.41875 0.0001	-0.16707 0.0439	0.00000 1.0000	-0.14652 0.0776	0.00000 1.0000	0.00000 1.0000	0.12893 0.1209	0.25005 0.0023	0.47669 0.0001
MGO	-0.19490 0.0184	0.24847 0.0025	0.53385 0.0001	0.16990 0.0403	-0.43129 0.0001	-0.06828 0.4128	0.00000 1.0000	-0.12316 0.1386	0.00000 1.0000	0.00000 1.0000	-0.16833 0.0423	-0.18670 0.0240	-0.07200 0.3878
AL2O3	-0.20849 0.0116	0.36422 0.0001	0.92720 0.0001	0.07797 0.3496	-0.79778 0.0001	-0.08330 0.3175	0.00000 1.0000	-0.10071 0.2265	0.00000 1.0000	0.00000 1.0000	0.06243 0.4541	-0.09751 0.2416	0.16000 0.0537
SIO2	-0.18557 0.0249	0.86795 0.0001	0.88739 0.0001	0.10470 0.2085	-0.80953 0.0001	-0.11480 0.1688	0.00000 1.0000	-0.11594 0.1634	0.00000 1.0000	0.00000 1.0000	0.04425 0.5959	-0.07437 0.3723	0.17219 0.0377
P2O5	0.25401 0.0020	-0.28482 0.0005	-0.88155 0.0001	-0.06901 0.4079	0.73315 0.0001	0.08521 0.3065	0.00000 1.0000	0.07389 0.3754	0.00000 1.0000	0.00000 1.0000	-0.03957 0.6353	0.21673 0.0086	-0.12701 0.1266
S	-0.09875 0.2357	0.03419 0.6820	-0.04653 0.5770	-0.03778 0.6507	0.10247 0.2184	0.18590 0.0247	0.00000 1.0000	-0.07300 0.3812	0.00000 1.0000	0.00000 1.0000	-0.06625 0.4269	-0.15078 0.0693	-0.15692 0.0586
K2O	-0.18171 0.0282	0.27866 0.0007	0.84796 0.0001	0.02298 0.7831	-0.73261 0.0001	-0.10154 0.2226	0.00000 1.0000	-0.06847 0.4115	0.00000 1.0000	0.00000 1.0000	0.08024 0.3356	-0.02665 0.7495	0.22010 0.0076
CAO	0.32000 0.0001	-0.37231 0.0001	-0.82885 0.0001	-0.14957 0.0716	0.69231 0.0001	0.05553 0.5056	0.00000 1.0000	0.13130 0.1142	0.00000 1.0000	0.00000 1.0000	0.06049 0.4683	0.14931 0.0721	0.04539 0.5865
TIO2	-0.18198 0.0279	0.35983 0.0001	0.92308 0.0001	0.07006 0.4007	-0.79177 0.0001	-0.06937 0.4054	0.00000 1.0000	-0.09330 0.2627	0.00000 1.0000	0.00000 1.0000	0.08674 0.2979	-0.08138 0.3288	0.22076 0.0074
V	-0.21223 0.0101	0.25027 0.0023	0.64025 0.0001	0.16023 0.0534	-0.59072 0.0001	0.07126 0.3927	0.00000 1.0000	0.13795 0.0968	0.00000 1.0000	0.00000 1.0000	-0.13339 0.1085	-0.16434 0.0475	-0.04021 0.6299
CR	-0.17698 0.0326	0.34420 0.0001	0.88961 0.0001	0.05935 0.4767	-0.77772 0.0001	-0.10213 0.2200	0.00000 1.0000	-0.11825 0.1552	0.00000 1.0000	0.00000 1.0000	0.11823 0.1552	-0.06297 0.4502	0.20240 0.0143
MNO	0.23933 0.0036	-0.38646 0.0001	-0.87915 0.0001	-0.10820 0.1936	0.80166 0.0001	0.06211 0.4564	0.00000 1.0000	0.10707 0.1983	0.00000 1.0000	0.00000 1.0000	-0.01342 0.8723	0.15136 0.0682	-0.08698 0.2965

OUTPUT DATASET FROM PROC CORR, WHOLE-ROCK ANALYSES
MARITIME RESOURCE RESEARCH LTD., D. PRINCE

RUN
22:33 THURSDAY, FEBRUARY 25, 1988

PEARSON CORRELATION COEFFICIENTS / PROB > IRI UNDER HO:RHO=0 / N = 146

	SR	Y	ZR	NB	MO	PD	AG	CD	IN	SN	SB	CS	BA
FE203	0.23148 0.0049	-0.27587 0.0008	-0.85042 0.0001	-0.07089 0.3952	0.71914 0.0001	0.04638 0.5783	0.00000 1.0000	0.07028 0.3992	0.00000 1.0000	0.00000 1.0000	-0.04222 0.6129	0.26574 0.0012	-0.15444 0.0627
CO	0.35889 0.0001	-0.15906 0.0552	-0.69059 0.0001	-0.14274 0.0857	0.69494 0.0001	-0.07621 0.3606	0.00000 1.0000	-0.04716 0.5719	0.00000 1.0000	0.00000 1.0000	-0.10851 0.1923	0.33183 0.0001	0.01233 0.8825
NI	-0.08862 0.2875	0.32627 0.0001	0.81874 0.0001	0.00350 0.9666	-0.66373 0.0001	-0.07851 0.3462	0.00000 1.0000	-0.14213 0.0870	0.00000 1.0000	0.00000 1.0000	0.07003 0.4009	0.04423 0.5960	0.31693 0.0001
CU	0.29157 0.0004	0.13382 0.1079	0.22841 0.0056	0.06480 0.4371	-0.15814 0.0566	0.04665 0.5761	0.00000 1.0000	-0.11578 0.1640	0.00000 1.0000	0.00000 1.0000	-0.09204 0.2692	0.00974 0.9071	0.01403 0.8656
ZN	-0.13789 0.0970	0.44955 0.0001	0.82469 0.0001	0.04286 0.6075	-0.66291 0.0001	-0.15818 0.0565	0.00000 1.0000	-0.20097 0.0150	0.00000 1.0000	0.00000 1.0000	-0.10000 0.2298	0.00063 0.9940	0.17030 0.0399
GA	0.16373 0.0483	0.43061 0.0001	0.25062 0.0023	-0.06977 0.4027	-0.08661 0.2986	-0.33910 0.0001	0.00000 1.0000	-0.32909 0.0001	0.00000 1.0000	0.00000 1.0000	-0.17913 0.0305	0.34218 0.0001	0.27036 0.0010
GE	-0.14824 0.0742	-0.18624 0.0244	-0.00635 0.9394	0.11604 0.1631	-0.02685 0.7477	0.32777 0.0001	0.00000 1.0000	0.64936 0.0001	0.00000 1.0000	0.00000 1.0000	-0.02440 0.7701	-0.21287 0.0099	-0.05752 0.4904
AS	-0.08491 0.3082	-0.17610 0.0335	-0.14324 0.0846	0.05308 0.4494	0.14994 0.0709	0.39716 0.0001	0.00000 1.0000	0.70734 0.0001	0.00000 1.0000	0.00000 1.0000	0.04583 0.5828	-0.16704 0.0439	-0.13993 0.0921
SE	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
RB	-0.08939 0.2833	0.51167 0.0001	0.64221 0.0001	-0.04885 0.5582	-0.57265 0.0001	-0.28172 0.0006	0.00000 1.0000	-0.25944 0.0016	0.00000 1.0000	0.00000 1.0000	-0.08540 0.3054	0.18004 0.0297	0.12089 0.1461
SR	1.00000 0.0000	0.04073 0.6255	-0.33082 0.0001	-0.16844 0.0421	0.23465 0.0044	-0.19238 0.0200	0.00000 1.0000	-0.11670 0.1607	0.00000 1.0000	0.00000 1.0000	0.02060 0.8050	0.44312 0.0001	0.54023 0.0001
Y	0.04073 0.6255	1.00000 0.0000	0.30248 0.0002	0.02872 0.7308	-0.28867 0.0004	-0.20557 0.0128	0.00000 1.0000	-0.23061 0.0051	0.00000 1.0000	0.00000 1.0000	-0.11639 0.1618	0.10864 0.1918	0.08712 0.2957
ZR	-0.33082 0.0001	0.30248 0.0002	1.00000 0.0000	0.07518 0.3671	-0.75310 0.0001	0.01261 0.8799	0.00000 1.0000	-0.02963 0.7226	0.00000 1.0000	0.00000 1.0000	0.07256 0.3841	-0.17781 0.0318	0.04283 0.6077
NB	-0.16844 0.0421	0.02872 0.7308	0.07518 0.3671	1.00000 0.0000	-0.11659 0.1611	0.08130 0.3293	0.00000 1.0000	0.01609 0.8471	0.00000 1.0000	0.00000 1.0000	-0.09292 0.2646	-0.14059 0.0905	-0.18050 0.0292
MO	0.23465 0.0044	-0.28867 0.0004	-0.75310 0.0001	-0.11659 0.1611	1.00000 0.0000	-0.00114 0.9891	0.00000 1.0000	-0.03808 0.6481	0.00000 1.0000	0.00000 1.0000	-0.06809 0.4142	0.12961 0.1190	-0.10441 0.2098
PD	-0.19238 0.0200	-0.20557 0.0128	0.01261 0.8799	0.08130 0.3293	-0.00114 0.9891	1.00000 0.0000	0.00000 1.0000	0.38090 0.0001	0.00000 1.0000	0.00000 1.0000	0.11647 0.1615	-0.25106 0.0022	-0.09519 0.2531
AG	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000

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PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	SR	Y	ZR	NB	MO	PD	AG	CD	IN	SN	SB	CS	BA
CD	-0.11670 0.1607	-0.23061 0.0051	-0.02963 0.7226	0.01609 0.8471	-0.03808 0.6481	0.38090 0.0001	0.00000 1.0000	1.00000 0.0000	0.00000 1.0000	0.00000 1.0000	0.05881 0.4807	-0.20423 0.0134	-0.05443 0.5141
IN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SB	0.02060 0.8050	-0.11639 0.1618	0.07256 0.3841	-0.09292 0.2646	-0.06809 0.4142	0.11647 0.1615	0.00000 1.0000	0.05881 0.4807	0.00000 1.0000	0.00000 1.0000	1.00000 0.0000	-0.09749 0.2417	0.16818 0.0424
CS	0.44312 0.0001	0.10864 0.1918	-0.17781 0.0318	-0.14059 0.0905	0.12961 0.1190	-0.25106 0.0022	0.00000 1.0000	-0.20423 0.0134	0.00000 1.0000	0.00000 1.0000	-0.09749 0.2417	1.00000 0.0000	0.32773 0.0001
BA	0.54023 0.0001	0.08712 0.2957	0.04283 0.6077	-0.18050 0.0292	-0.10441 0.2098	-0.09519 0.2531	0.00000 1.0000	-0.05443 0.5141	0.00000 1.0000	0.00000 1.0000	0.16818 0.0424	0.32773 0.0001	1.00000 0.0000
LA	-0.08252 0.3221	0.43338 0.0001	0.60831 0.0001	0.11891 0.1529	-0.48587 0.0001	-0.12783 0.1241	0.00000 1.0000	-0.09418 0.2582	0.00000 1.0000	0.00000 1.0000	-0.24409 0.0030	0.10554 0.2049	0.08382 0.3145
CE	0.01055 0.8994	0.37481 0.0001	0.32324 0.0001	0.09279 0.2653	-0.20288 0.0141	-0.04976 0.5509	0.00000 1.0000	-0.09704 0.2440	0.00000 1.0000	0.00000 1.0000	-0.32164 0.0001	0.18387 0.0263	0.01732 0.8357
ND	-0.06208 0.4566	0.29461 0.0003	0.40010 0.0001	0.17119 0.0388	-0.27523 0.0008	0.04630 0.5789	0.00000 1.0000	-0.13600 0.1017	0.00000 1.0000	0.00000 1.0000	-0.19850 0.0163	0.04082 0.6247	-0.03724 0.6554
SM	-0.03877 0.6422	0.08635 0.3000	0.13972 0.0926	0.14090 0.0898	-0.05918 0.4780	0.16116 0.0520	0.00000 1.0000	-0.08169 0.3270	0.00000 1.0000	0.00000 1.0000	-0.07599 0.3620	-0.02454 0.7687	-0.09660 0.2461
EU	0.52460 0.0001	0.19679 0.0173	-0.10793 0.1947	-0.14277 0.0856	0.08958 0.2817	-0.15893 0.0554	0.00000 1.0000	-0.23236 0.0048	0.00000 1.0000	0.00000 1.0000	-0.10426 0.2104	0.45808 0.0001	0.64352 0.0001
GD	0.15824 0.0614	0.31424 0.0001	-0.13786 0.0970	0.02002 0.8105	0.22440 0.0065	-0.17261 0.0372	0.00000 1.0000	-0.25112 0.0022	0.00000 1.0000	0.00000 1.0000	-0.33031 0.0001	0.34088 0.0001	-0.08441 0.3111
DY	0.14440 0.0821	0.15298 0.0653	-0.26994 0.0010	0.11563 0.1646	0.34414 0.0001	0.12023 0.1483	0.00000 1.0000	-0.07828 0.3476	0.00000 1.0000	0.00000 1.0000	-0.28483 0.0019	0.27501 0.0008	-0.12530 0.1318
ER	0.06389 0.4451	0.06929 0.4060	-0.11638 0.1620	0.16231 0.0503	0.18980 0.0218	0.18755 0.0234	0.00000 1.0000	-0.04124 0.6211	0.00000 1.0000	0.00000 1.0000	-0.11145 0.1805	0.17993 0.0298	-0.12010 0.1487
LU	0.00931 0.9112	0.08750 0.2937	0.03306 0.6920	0.09553 0.2514	0.03284 0.6939	0.07064 0.3968	0.00000 1.0000	-0.15540 0.0611	0.00000 1.0000	0.00000 1.0000	-0.07219 0.3866	0.04347 0.6024	-0.00720 0.9313
HF	-0.14832 0.0740	0.26492 0.0012	0.79332 0.0001	0.08598 0.3021	-0.62234 0.0001	-0.07831 0.3475	0.00000 1.0000	-0.08783 0.2918	0.00000 1.0000	0.00000 1.0000	0.01281 0.8780	-0.06554 0.4319	0.12359 0.1372
TA	-0.24168 0.0033	0.24323 0.0031	0.62460 0.0001	0.07231 0.3857	-0.54271 0.0001	-0.11248 0.1765	0.00000 1.0000	-0.14726 0.0761	0.00000 1.0000	0.00000 1.0000	-0.09162 0.2714	-0.13696 0.0993	-0.00544 0.9480

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	SR	Y	ZR	NB	MO	PD	AG	CD	IN	SN	SB	CS	BA
W	0.29013 0.0004	-0.03474 0.6772	-0.34350 0.0001	-0.07281 0.3824	0.27694 0.0007	-0.12685 0.1271	0.00000 1.0000	-0.06341 0.4470	0.00000 1.0000	0.00000 1.0000	0.05023 0.5471	0.26022 0.0015	0.16961 0.0407
PT	-0.07461 0.3707	-0.07186 0.3887	-0.05458 0.5129	0.12189 0.1428	-0.00265 0.9747	0.40364 0.0001	0.00000 1.0000	0.14282 0.0855	0.00000 1.0000	0.00000 1.0000	0.09185 0.2702	-0.05511 0.5088	-0.03725 0.6553
TL	-0.00863 0.9177	-0.08349 0.3164	-0.05377 0.5192	0.08527 0.3062	0.06273 0.4519	0.14462 0.0816	0.00000 1.0000	-0.03802 0.6487	0.00000 1.0000	0.00000 1.0000	0.04404 0.5976	-0.06779 0.4162	-0.06930 0.4059
PB	-0.02523 0.7624	-0.00046 0.9956	0.34461 0.0001	-0.02275 0.7852	-0.23043 0.0051	-0.02676 0.7485	0.00000 1.0000	-0.00273 0.9739	0.00000 1.0000	0.00000 1.0000	-0.00154 0.9853	0.06981 0.4024	0.04318 0.6048
BI	-0.04151 0.6188	-0.04861 0.5601	-0.08639 0.2998	0.07623 0.3604	0.00967 0.9078	0.01377 0.8689	0.00000 1.0000	-0.05579 0.5036	0.00000 1.0000	0.00000 1.0000	-0.01189 0.8867	0.19798 0.0166	-0.00641 0.9388
TH	-0.08590 0.3026	0.53523 0.0001	0.71724 0.0001	-0.03328 0.6901	-0.56074 0.0001	-0.29484 0.0003	0.00000 1.0000	-0.32713 0.0001	0.00000 1.0000	0.00000 1.0000	-0.09489 0.2546	0.09295 0.2644	0.15526 0.0613
U	-0.05675 0.4962	0.26884 0.0010	0.19729 0.0170	0.04779 0.5668	-0.13237 0.1112	-0.07588 0.3627	0.00000 1.0000	-0.15350 0.0643	0.00000 1.0000	0.00000 1.0000	-0.13975 0.0925	-0.04470 0.5922	-0.05376 0.5193
LOI	-0.11019 0.1855	-0.31338 0.0001	-0.62838 0.0001	-0.06143 0.4614	0.60421 0.0001	0.19454 0.0186	0.00000 1.0000	0.15986 0.0539	0.00000 1.0000	0.00000 1.0000	-0.12768 0.1246	-0.36569 0.0001	-0.34434 0.0001

	LA	CE	ND	SM	EU	GD	DY	ER	LU	HF	TA	W	PT
AU	-0.11445 0.1689	-0.03415 0.6823	0.09887 0.2351	0.20782 0.0118	-0.06143 0.4614	-0.03473 0.6773	0.11562 0.1646	0.18592 0.0247	0.18465 0.0257	-0.05811 0.4860	-0.14145 0.0886	0.09615 0.2483	-0.04444 0.5943
LI	-0.03217 0.6999	-0.03910 0.6394	0.17307 0.0367	0.21945 0.0078	-0.04945 0.5533	0.02182 0.7938	0.08170 0.3269	0.12912 0.1203	0.19668 0.0173	0.02566 0.7585	0.12556 0.1310	-0.27736 0.0007	-0.00073 0.9930
BE	-0.32450 0.0001	-0.16386 0.0481	-0.12231 0.1414	0.03540 0.6714	-0.08320 0.3181	-0.06246 0.4539	0.16403 0.0479	0.14472 0.0814	0.00364 0.9653	-0.37008 0.0001	-0.29096 0.0004	0.31199 0.0001	0.17063 0.0395
B	0.25036 0.0023	0.22910 0.0054	0.10987 0.1868	-0.01028 0.9020	0.22675 0.0059	0.15648 0.0593	0.02239 0.7885	0.01103 0.8948	0.00704 0.9328	0.18218 0.0277	0.08485 0.3086	-0.02473 0.7670	0.04613 0.5803
NA2O	0.41474 0.0001	0.23296 0.0047	0.22145 0.0072	-0.01018 0.9029	0.27019 0.0010	0.00933 0.9110	-0.12808 0.1234	-0.12194 0.1426	0.03817 0.6474	0.49222 0.0001	0.32954 0.0001	-0.02193 0.7928	-0.05003 0.5487
MGO	0.44042 0.0001	0.23881 0.0037	0.26404 0.0013	0.10896 0.1905	-0.09061 0.2767	0.08759 0.2931	-0.06768 0.4170	0.06120 0.4631	0.02026 0.8082	0.52861 0.0001	0.35618 0.0001	-0.39110 0.0001	-0.12454 0.1342
AL2O3	0.66960 0.0001	0.35486 0.0001	0.40546 0.0001	0.10903 0.1902	-0.01825 0.8269	-0.08699 0.2965	-0.30011 0.0002	-0.16054 0.0529	0.01719 0.8369	0.84187 0.0001	0.65329 0.0001	-0.32065 0.0001	-0.11335 0.1731
SIO2	0.64407 0.0001	0.32044 0.0001	0.35361 0.0001	0.06702 0.4215	-0.02122 0.7993	-0.10916 0.1897	-0.32069 0.0001	-0.18420 0.0260	-0.03042 0.7155	0.81999 0.0001	0.64376 0.0001	-0.37025 0.0001	-0.12141 0.1443

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PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	LA	CE	ND	SM	EU	GD	DY	ER	LU	HF	TA	W	PT
P2O5	-0.55833 0.0001	-0.21736 0.0084	-0.27881 0.0007	-0.01843 0.8252	0.10627 0.2017	0.20163 0.0147	0.41809 0.0001	0.26781 0.0011	0.03331 0.6898	-0.78810 0.0001	-0.61843 0.0001	0.40323 0.0001	0.11996 0.1492
S	0.09553 0.2514	0.20311 0.0139	0.08045 0.3344	0.07101 0.3944	-0.01115 0.8937	0.32034 0.0001	0.25607 0.0018	0.19805 0.0166	0.04859 0.5603	0.00420 0.9599	-0.10458 0.2091	-0.00810 0.9227	-0.08162 0.3274
K2O	0.54879 0.0001	0.24526 0.0028	0.30959 0.0001	0.05963 0.4746	0.02539 0.7610	-0.16508 0.0465	-0.38825 0.0001	-0.23781 0.0038	-0.02034 0.8075	0.75512 0.0001	0.62430 0.0001	-0.20794 0.0118	-0.13316 0.1091
CAO	-0.59371 0.0001	-0.31173 0.0001	-0.32953 0.0001	-0.05673 0.4964	0.14766 0.0753	0.07298 0.3814	0.27077 0.0009	0.16495 0.0466	0.01880 0.8218	-0.71677 0.0001	-0.61714 0.0001	0.38615 0.0001	0.14243 0.0864
TIO2	0.65467 0.0001	0.34091 0.0001	0.39380 0.0001	0.10541 0.2054	0.01878 0.8220	-0.11666 0.1608	-0.31070 0.0001	-0.15564 0.0607	0.02934 0.7252	0.83366 0.0001	0.63366 0.0001	-0.30286 0.0002	-0.10634 0.2014
V	0.50866 0.0001	0.28440 0.0005	0.32470 0.0001	0.10545 0.2052	-0.15379 0.0638	-0.12256 0.1405	-0.19292 0.0197	-0.09381 0.2600	-0.06843 0.4118	0.54899 0.0001	0.47878 0.0001	-0.24343 0.0031	0.07514 0.3674
CR	0.61870 0.0001	0.31073 0.0001	0.36280 0.0001	0.09432 0.2575	0.00685 0.9346	-0.13553 0.1029	-0.32061 0.0001	-0.14862 0.0734	0.03307 0.6919	0.81054 0.0001	0.63475 0.0001	-0.28687 0.0004	-0.14591 0.0789
MNO	-0.63885 0.0001	-0.33467 0.0001	-0.37673 0.0001	-0.09910 0.2340	0.06282 0.4513	0.07115 0.3935	0.29010 0.0004	0.15231 0.0665	0.00973 0.9072	-0.80615 0.0001	-0.64845 0.0001	0.31704 0.0001	0.12960 0.1190
FE2O3	-0.55864 0.0001	-0.24264 0.0032	-0.31274 0.0001	-0.06863 0.4105	0.05912 0.4784	0.17873 0.0309	0.35205 0.0001	0.20871 0.0115	0.00578 0.9448	-0.77153 0.0001	-0.59423 0.0001	0.47160 0.0001	0.09556 0.2512
CO	-0.33881 0.0001	-0.06039 0.4690	-0.20018 0.0154	-0.07143 0.3916	0.22102 0.0073	0.34288 0.0001	0.35817 0.0001	0.16233 0.0503	0.04559 0.5848	-0.56450 0.0001	-0.50266 0.0001	0.33110 0.0001	0.01131 0.8922
NI	0.58394 0.0001	0.31651 0.0001	0.32762 0.0001	0.07168 0.3899	0.08912 0.2848	-0.10239 0.2188	-0.23138 0.0050	-0.10096 0.2253	0.05427 0.5153	0.73944 0.0001	0.48742 0.0001	-0.23825 0.0038	-0.12767 0.1246
CU	0.29394 0.0003	0.28465 0.0005	0.27015 0.0010	0.14660 0.0775	0.09586 0.2497	0.15336 0.0646	0.08276 0.3207	0.07951 0.3401	0.05007 0.5484	0.26380 0.0013	0.15508 0.0616	-0.06810 0.4141	-0.09385 0.2599
ZN	0.71130 0.0001	0.46713 0.0001	0.46149 0.0001	0.15537 0.0611	0.11078 0.1831	0.16439 0.0474	-0.11069 0.1835	-0.03223 0.6993	0.06778 0.4163	0.77592 0.0001	0.59624 0.0001	-0.30254 0.0002	-0.14122 0.0891
GA	0.47526 0.0001	0.44407 0.0001	0.31211 0.0001	0.07188 0.3886	0.45518 0.0001	0.47948 0.0001	0.18629 0.0596	0.03827 0.6465	0.14766 0.0753	0.32404 0.0001	0.28672 0.0005	-0.01560 0.8518	-0.20279 0.0141
GE	-0.02340 0.7792	-0.05957 0.4751	-0.08442 0.3110	-0.05882 0.4807	-0.22292 0.0068	-0.24130 0.0033	-0.08553 0.3047	-0.03980 0.6334	-0.15634 0.0595	-0.02554 0.7596	0.00304 0.9710	-0.06821 0.4133	0.37300 0.0001
AS	-0.08932 0.2837	-0.03353 0.6879	-0.12031 0.1480	-0.06708 0.4211	-0.19698 0.0172	-0.13054 0.1163	0.06359 0.4457	0.03684 0.6589	-0.16623 0.0449	-0.17533 0.0343	-0.17604 0.0335	-0.05628 0.4999	0.38198 0.0001
SE	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	LA	CE	ND	SM	EU	GD	DY	ER	LU	HF	TA	W	PT
RB	0.55710 0.0001	0.31363 0.0001	0.33331 0.0001	0.05257 0.5286	0.14220 0.0869	0.07157 0.3906	-0.20882 0.0114	-0.17766 0.0319	0.02972 0.7217	0.57638 0.0001	0.58586 0.0001	-0.14660 0.0774	-0.18921 0.0222
SR	-0.08252 0.3221	0.01055 0.8994	-0.06208 0.4566	-0.03877 0.6422	0.52460 0.0001	0.15524 0.0614	0.14440 0.0821	0.06369 0.4451	0.00931 0.9112	-0.14832 0.0740	-0.24168 0.0033	0.29013 0.0004	-0.07461 0.3707
Y	0.43338 0.0001	0.37481 0.0001	0.29461 0.0003	0.08635 0.3000	0.19679 0.0173	0.31424 0.0001	0.15298 0.0653	0.06929 0.4060	0.08750 0.2937	0.26492 0.0012	0.24323 0.0031	-0.03474 0.6772	-0.07186 0.3887
ZR	0.60831 0.0001	0.32324 0.0001	0.40010 0.0001	0.13972 0.0926	-0.10793 0.1947	-0.13786 0.0970	-0.26994 0.0010	-0.11635 0.1620	0.03306 0.6920	0.79332 0.0001	0.62460 0.0001	-0.34350 0.0001	-0.05458 0.5129
NB	0.11891 0.1529	0.09279 0.2653	0.17119 0.0388	0.14090 0.0898	-0.14277 0.0856	0.02002 0.8105	0.11563 0.1646	0.16231 0.0503	0.09553 0.2514	0.08598 0.3021	0.07231 0.3857	-0.07281 0.3824	0.12189 0.1428
MO	-0.48587 0.0001	-0.20288 0.0141	-0.27523 0.0008	-0.05918 0.4780	0.08958 0.2817	0.22440 0.0065	0.34414 0.0001	0.18980 0.0218	0.03284 0.6939	-0.62234 0.0001	-0.54271 0.0001	0.27694 0.0007	-0.00265 0.9747
PD	-0.12783 0.1241	-0.04976 0.5509	0.04630 0.5789	0.16116 0.0520	-0.15893 0.0554	-0.17261 0.0372	0.12023 0.1483	0.18755 0.0234	0.07064 0.3968	-0.07831 0.3476	-0.11248 0.1765	-0.12685 0.1271	0.40364 0.0001
AG	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
CD	-0.09418 0.2582	-0.09704 0.2440	-0.13600 0.1017	-0.08169 0.3270	-0.23236 0.0048	-0.25112 0.0022	-0.07828 0.3476	-0.04124 0.6211	-0.15540 0.0611	-0.08783 0.2918	-0.14726 0.0761	-0.06341 0.4470	0.14282 0.0855
IN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SB	-0.24409 0.0030	-0.32164 0.0001	-0.19850 0.0163	-0.07599 0.3620	-0.10426 0.2104	-0.33031 0.0001	-0.25483 0.0019	-0.11145 0.1805	-0.07219 0.3866	0.01281 0.8780	-0.09162 0.2714	0.05023 0.5471	0.09185 0.2702
CS	0.10554 0.2049	0.18387 0.0263	0.04082 0.6247	-0.02454 0.7687	0.45808 0.0001	0.34088 0.0001	0.27501 0.0008	0.17993 0.0298	0.04347 0.6024	-0.06554 0.4319	-0.13696 0.0993	0.26022 0.0015	-0.05511 0.5088
BA	0.08382 0.3145	0.01732 0.8357	-0.03724 0.6554	-0.09660 0.2461	0.64352 0.0001	-0.08441 0.3111	-0.12530 0.1318	-0.12010 0.1487	-0.00720 0.9313	0.12359 0.1372	-0.00844 0.9480	0.16961 0.0407	-0.03725 0.6553
LA	1.00000 0.0000	0.89217 0.0001	0.40687 0.0001	-0.02333 0.7798	0.05591 0.5027	0.51429 0.0001	0.22872 0.0055	0.06545 0.4325	-0.15323 0.0648	0.59679 0.0001	0.39014 0.0001	-0.16972 0.0406	-0.10150 0.2228
CE	0.89217 0.0001	1.00000 0.0000	0.47152 0.0001	0.10640 0.2012	0.16902 0.0414	0.72864 0.0001	0.55181 0.0001	0.31250 0.0001	-0.02568 0.7584	0.32588 0.0001	0.19450 0.0186	-0.04285 0.6076	-0.08272 0.3209
ND	0.40687 0.0001	0.47152 0.0001	1.00000 0.0000	0.88159 0.0001	0.46802 0.0001	0.27435 0.0008	0.47521 0.0001	0.60963 0.0001	0.77966 0.0001	0.34086 0.0001	0.42070 0.0001	-0.21962 0.0077	0.03422 0.6817

D. PRINCE, AUTHOR

PEARSON CORRELATION COEFFICIENTS / PROB > IRI UNDER HO:RHO=0 / N = 146

	LA	CE	ND	SM	EU	GD	DY	ER	LU	HF	TA	W	PT
SM	-0.02333 0.7798	0.10640 0.2012	0.88159 0.0001	1.00000 0.0000	0.46426 0.0001	0.06336 0.4474	0.45407 0.0001	0.71616 0.0001	0.92166 0.0001	0.07730 0.3537	0.25757 0.0017	-0.17350 0.0362	0.09553 0.2514
EU	0.05591 0.5027	0.16902 0.0414	0.46802 0.0001	0.46426 0.0001	1.00000 0.0000	0.26830 0.0011	0.35528 0.0001	0.37846 0.0001	0.55799 0.0001	-0.00772 0.9264	0.05631 0.4996	0.15237 0.0664	-0.07399 0.3748
GD	0.51429 0.0001	0.72864 0.0001	0.27435 0.0008	0.06336 0.4474	0.26830 0.0011	1.00000 0.0000	0.71580 0.0001	0.41709 0.0001	0.00792 0.9244	-0.02787 0.7384	-0.11398 0.1707	0.09886 0.2351	-0.10344 0.2141
DY	0.22872 0.0055	0.55181 0.0001	0.47521 0.0001	0.45407 0.0001	0.35528 0.0001	0.71580 0.0001	1.00000 0.0000	0.79376 0.0001	0.37603 0.0001	-0.25291 0.0021	-0.18623 0.0244	0.05534 0.5071	0.03263 0.6958
ER	0.06545 0.4325	0.31250 0.0001	0.60963 0.0001	0.71616 0.0001	0.37846 0.0001	0.41709 0.0001	0.79376 0.0001	1.00000 0.0000	0.63291 0.0001	-0.15937 0.0547	-0.04359 0.6014	-0.07377 0.3762	0.06027 0.4699
LU	-0.15323 0.0648	-0.02568 0.7584	0.77966 0.0001	0.92166 0.0001	0.55799 0.0001	0.00792 0.9244	0.37603 0.0001	0.63291 0.0001	1.00000 0.0000	0.00522 0.9502	0.21257 0.0100	-0.08926 0.2840	0.03240 0.6978
HF	0.59679 0.0001	0.32588 0.0001	0.34086 0.0001	0.07730 0.3537	-0.00772 0.9264	-0.02787 0.7384	-0.25291 0.0021	-0.15937 0.0547	0.00522 0.9502	1.00000 0.0000	0.60626 0.0001	-0.26226 0.0014	-0.07918 0.3421
TA	0.39014 0.0001	0.19450 0.0186	0.42070 0.0001	0.25757 0.0017	0.05631 0.4996	-0.11398 0.1707	-0.18623 0.0244	-0.04359 0.6014	0.21257 0.0100	0.60626 0.0001	1.00000 0.0000	-0.19573 0.0179	-0.10231 0.2192
W	-0.16972 0.0406	-0.04285 0.6076	-0.21962 0.0077	-0.17350 0.0362	0.15237 0.0664	0.09886 0.2351	0.05534 0.5071	-0.07377 0.3762	-0.08926 0.2840	-0.26226 0.0014	-0.19573 0.0179	1.00000 0.0000	-0.07163 0.3903
PT	-0.10150 0.2228	-0.08272 0.3209	0.03422 0.6817	0.09553 0.2514	-0.07399 0.3748	-0.10344 0.2141	0.03263 0.6958	0.06027 0.4699	0.03240 0.6978	-0.07918 0.3421	-0.10231 0.2192	-0.07163 0.3903	1.00000 0.0000
TL	-0.39849 0.0001	-0.29881 0.0002	0.64843 0.0001	0.88561 0.0001	0.42708 0.0001	-0.24808 0.0025	0.18783 0.0232	0.49425 0.0001	0.91451 0.0001	-0.09129 0.2731	0.14676 0.0771	-0.08463 0.3098	0.11158 0.1800
PB	0.31321 0.0001	0.21245 0.0100	0.15096 0.0689	0.02373 0.7761	-0.00837 0.9201	0.09784 0.2400	0.01768 0.8322	-0.00135 0.9871	-0.01928 0.8173	0.29040 0.0004	0.13546 0.1031	-0.17497 0.0347	-0.08767 0.2927
BI	-0.00140 0.9866	0.01196 0.8860	-0.03198 0.7016	-0.01575 0.8504	0.01960 0.8143	0.04216 0.6134	0.02386 0.7750	0.01593 0.8487	0.00699 0.9333	-0.10999 0.1863	-0.02606 0.7549	0.10574 0.2040	0.10908 0.1901
TH	0.69618 0.0001	0.48879 0.0001	0.42297 0.0001	0.09112 0.2740	0.18710 0.0237	0.23538 0.0042	-0.10836 0.1929	-0.09906 0.2342	0.08540 0.3054	0.71661 0.0001	0.66618 0.0001	-0.19527 0.0182	-0.21383 0.0096
U	0.22457 0.0064	0.16155 0.0514	0.10460 0.2090	0.00400 0.9617	-0.01563 0.8514	0.17151 0.0385	-0.00189 0.9820	-0.04121 0.6214	-0.01461 0.8611	0.19535 0.0181	0.15729 0.0580	-0.11462 0.1683	-0.12491 0.1331
LOI	-0.44798 0.0001	-0.25039 0.0023	-0.49193 0.0001	-0.29594 0.0003	-0.32227 0.0001	0.03788 0.6499	0.11067 0.1836	-0.05896 0.4796	-0.24316 0.0031	-0.60988 0.0001	-0.50927 0.0001	0.05744 0.4910	0.06356 0.4460

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 146

	TL	PB	BI	TH	U	LOI
AU	0.18916 0.0222	0.03967 0.6345	-0.03795 0.6492	-0.20563 0.0128	-0.09740 0.2422	0.18868 0.0226
LI	0.17599 0.0336	-0.01142 0.8912	-0.04322 0.6045	0.05939 0.4764	0.22897 0.0054	0.24910 0.0024
BE	0.13597 0.1017	-0.18130 0.0285	-0.05388 0.5183	-0.56398 0.0001	-0.28291 0.0005	0.23325 0.0046
B	-0.09733 0.2425	0.05332 0.5227	-0.05892 0.4799	0.25103 0.0022	0.09525 0.2528	-0.35995 0.0001
NA2O	-0.08644 0.2995	0.34678 0.0001	0.01740 0.8349	0.64740 0.0001	0.11848 0.1544	-0.61678 0.0001
MGO	-0.08401 0.3134	0.22382 0.0066	-0.05262 0.5282	0.47407 0.0001	0.23286 0.0047	-0.28426 0.0005
AL2O3	-0.09064 0.2766	0.33061 0.0001	-0.06774 0.4166	0.81184 0.0001	0.23047 0.0051	-0.73013 0.0001
SIO2	-0.12315 0.1386	0.31698 0.0001	-0.05289 0.5261	0.77412 0.0001	0.20008 0.0155	-0.73459 0.0001
P2O5	0.11684 0.1602	-0.30584 0.0002	0.05823 0.4851	-0.75582 0.0001	-0.26177 0.0014	0.55904 0.0001
S	-0.04872 0.5592	0.06079 0.4661	-0.07391 0.3753	0.00274 0.9738	0.14193 0.0875	0.23073 0.0051
K2O	-0.08597 0.3022	0.21570 0.0089	-0.04722 0.5714	0.69751 0.0001	0.21052 0.0108	-0.68109 0.0001
CAO	0.11300 0.1745	-0.24225 0.0032	0.02447 0.7694	-0.71290 0.0001	-0.28340 0.0005	0.53264 0.0001
TIO2	-0.08327 0.3177	0.31209 0.0001	-0.07902 0.3431	0.79741 0.0001	0.21081 0.0106	-0.72954 0.0001
V	-0.05902 0.4792	0.22353 0.0067	-0.06923 0.4064	0.35794 0.0001	0.13894 0.0944	-0.43483 0.0001
CR	-0.08265 0.3213	0.29777 0.0003	-0.07976 0.3386	0.78462 0.0001	0.18196 0.0279	-0.72218 0.0001
MNO	0.10366 0.2131	-0.31313 0.0001	0.10065 0.2267	-0.75671 0.0001	-0.24240 0.0032	0.65767 0.0001

PEARSON CORRELATION COEFFICIENTS / PROB > IRI UNDER HO:RHO=0 / N = 146

	TL	PB	BI	TH	U	LOI
FE2O3	0.09223	-0.27762	0.04649	-0.72311	-0.24051	0.50008
	0.2682	0.0007	0.5774	0.0001	0.0035	0.0001
CO	0.02119	-0.21909	0.04981	-0.41800	-0.00696	0.44441
	0.7996	0.0079	0.5504	0.0001	0.9335	0.0001
NI	-0.10023	0.25847	-0.08709	0.72839	0.17077	-0.66683
	0.2287	0.0016	0.2959	0.0001	0.0393	0.0001
CU	-0.00264	0.10585	-0.00096	0.27668	0.15697	-0.21347
	0.9748	0.2035	0.9908	0.0007	0.0585	0.0097
ZN	-0.10403	0.36583	-0.05292	0.84842	0.28567	-0.69127
	0.2115	0.0001	0.5258	0.0001	0.0005	0.0001
GA	-0.09195	0.14451	0.01549	0.68922	0.28036	-0.35089
	0.2697	0.0818	0.8527	0.0001	0.0006	0.0001
GE	-0.03680	-0.11816	-0.05400	-0.27566	-0.13416	0.03083
	0.6593	0.1555	0.5174	0.0008	0.1064	0.7118
AS	-0.04141	-0.07271	-0.05346	-0.39457	-0.15742	0.27157
	0.6197	0.3831	0.5216	0.0001	0.0578	0.0009
SE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RB	-0.08878	0.19844	0.01952	0.75384	0.23440	-0.60721
	0.2866	0.0163	0.8151	0.0001	0.0044	0.0001
SR	-0.00863	-0.02523	-0.04151	-0.08590	-0.05675	-0.11019
	0.9177	0.7624	0.6188	0.3026	0.4962	0.1855
Y	-0.08349	-0.00046	-0.04861	0.53523	0.26984	-0.31338
	0.3164	0.9956	0.5601	0.0001	0.0010	0.0001
ZR	-0.05377	0.34461	-0.08639	0.71724	0.19729	-0.62838
	0.5192	0.0001	0.2998	0.0001	0.0170	0.0001
NB	0.08527	-0.02275	0.07623	-0.03328	0.04779	-0.06143
	0.3062	0.7852	0.3604	0.6901	0.5668	0.4614
MO	0.05273	-0.23043	0.00967	-0.56074	-0.13237	0.60421
	0.4519	0.0051	0.9078	0.0001	0.1112	0.0001
PD	0.14462	-0.02676	0.01377	-0.29484	-0.07588	0.19454
	0.0816	0.7485	0.8689	0.0003	0.3627	0.0186
AG	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

PEARSON CORRELATION COEFFICIENTS / PROB > IRI UNDER HO:RHO=0 / N = 146

	TL	PB	BI	TH	U	LOI
CD	-0.03802 0.6487	-0.00273 0.9739	-0.05579 0.5036	-0.32713 0.0001	-0.15350 0.0643	0.15986 0.0539
IN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SN	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000	0.00000 1.0000
SB	0.04404 0.5976	-0.00154 0.9853	-0.01189 0.8867	-0.09489 0.2546	-0.13975 0.0925	-0.12768 0.1246
CS	-0.06779 0.4162	0.06981 0.4024	0.19798 0.0166	0.09295 0.2644	-0.04470 0.5922	-0.36669 0.0001
BA	-0.06930 0.4059	0.04318 0.6048	-0.00641 0.9388	0.15526 0.0613	-0.05376 0.5193	-0.34434 0.0001
LA	-0.39849 0.0001	0.31321 0.0001	-0.00140 0.9866	0.69618 0.0001	0.22457 0.0064	-0.44798 0.0001
CE	-0.29881 0.0002	0.21245 0.0100	0.01196 0.8860	0.48879 0.0001	0.16155 0.0514	-0.25039 0.0023
ND	0.64843 0.0001	0.15096 0.0689	-0.03198 0.7016	0.42297 0.0001	0.10460 0.2090	-0.49193 0.0001
SM	0.88661 0.0001	0.02373 0.7761	-0.01575 0.8504	0.09112 0.2740	0.00400 0.9617	-0.29594 0.0003
EU	0.42708 0.0001	-0.00837 0.9201	0.01960 0.8143	0.18710 0.0237	-0.01563 0.8514	-0.32227 0.0001
GD	-0.24808 0.0025	0.09784 0.2400	0.04216 0.6134	0.23538 0.0042	0.17151 0.0385	0.03788 0.6499
DY	0.18783 0.0232	0.01768 0.8322	0.02386 0.7750	-0.10836 0.1929	-0.00189 0.9820	0.11067 0.1836
ER	0.49425 0.0001	-0.00135 0.9871	0.01593 0.8487	-0.09906 0.2342	-0.04121 0.6214	-0.05896 0.4796
LU	0.91481 0.0001	-0.01928 0.8173	0.00699 0.9333	0.08540 0.3054	-0.01461 0.8611	-0.24316 0.0031
HF	-0.09129 0.2731	0.29040 0.0004	-0.10999 0.1863	0.71661 0.0001	0.19536 0.0181	-0.60988 0.0001
TA	0.14676 0.0771	0.13546 0.1031	-0.02606 0.7549	0.66618 0.0001	0.15729 0.0580	-0.50927 0.0001

PEARSON CORRELATION COEFFICIENTS / PROB > IRI UNDER HO:RHO=0 / N = 146

	TL	PB	BI	TH	U	LOI
W	-0.08463 0.3098	-0.17497 0.0347	0.10574 0.2040	-0.19527 0.0182	-0.11462 0.1683	0.05744 0.4910
PT	0.11158 0.1800	-0.08767 0.2927	0.10905 0.1901	-0.21383 0.0096	-0.12491 0.1331	0.06356 0.4460
TL	1.00000 0.0000	-0.06997 0.4014	-0.01012 0.9035	-0.13069 0.1159	-0.10337 0.2144	-0.17186 0.0381
PB	-0.06997 0.4014	1.00000 0.0000	0.03871 0.6427	0.27577 0.0008	0.06279 0.4515	-0.27683 0.0007
BI	-0.01012 0.9035	0.03871 0.6427	1.00000 0.0000	-0.01546 0.8531	-0.01862 0.8235	0.00239 0.9771
TH	-0.13069 0.1159	0.27577 0.0008	-0.01546 0.8531	1.00000 0.0000	0.33145 0.0001	-0.60620 0.0001
U	-0.10337 0.2144	0.06279 0.4515	-0.01862 0.8235	0.33145 0.0001	1.00000 0.0000	-0.00218 0.9791
LOI	-0.17186 0.0381	-0.27683 0.0007	0.00239 0.9771	-0.60620 0.0001	-0.00218 0.9791	1.00000 0.0000

APPENDIX NUMBER 3

Length Weighted Oxide Calculations for Assay Results

PLYMOUTH TRENCH 1
ASSAYS - UNIT SUBDIVISION

Formulas → / V		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnCalc	Mn*"Length (ft)" MnCalc
	Plymouth Trench 1							
	A							
	T1-1A	0.00	15.00	15.00	0.14%	0.11%	2.10%	1.63%
	T1-1B	15.00	30.00	15.00	0.13%	0.10%	1.95%	1.51%
	T1-1C	30.00	50.00	20.00	0.11%	0.09%	2.20%	1.70%
	T1-2A	50.00	55.00	5.00	0.15%	0.12%	0.75%	0.58%
	T1-2B	55.00	61.00	6.00	0.14%	0.11%	0.84%	0.65%
	T1-3A	61.00	90.00	29.00	0.14%	0.11%	4.06%	3.14%
	T1-3B	90.00	120.00	30.00	0.11%	0.09%	3.30%	2.56%
	T1-4	120.00	130.00	10.00	0.38%	0.29%	3.80%	2.94%
	T1-5	130.00	134.00	4.00	0.29%	0.22%	1.16%	0.90%
	T1-6A	134.00	152.00	18.00	0.25%	0.19%	4.50%	3.49%
	T1-6B	152.00	179.00	27.00	2.09%	1.62%	56.43%	43.71%
	T1-7	212.00	232.00	20.00	5.41%	4.19%	108.20%	83.81%
@Total A	Total A	1049.00	1248.00	199.00	9.34%	7.23%	189.29%	146.62%
Total A/199	Average A	5.27	6.27	1.00	0.05%	0.04%	0.95%	0.74%
	B							
	T1-8	232.00	273.00	41.00	17.10%	13.25%	701.10%	543.07%
	T1-10	321.00	342.00	21.00	19.00%	14.72%	399.00%	309.06%
	T1-10A	340.00	342.00	2.00	17.80%	13.79%	35.60%	27.58%
	T1-11	342.00	376.00	34.00	19.70%	15.26%	669.80%	518.82%
@total B	Total B	1235.00	1333.00	98.00	73.60%	57.01%	1,805.50%	1,398.53%
total B / 98	Average B	12.60	13.60	1.00	0.75%	0.58%	18.42%	14.27%
	C							
	T1-12	376.00	449.00	73.00	18.50%	14.33%	1,350.50%	1,046.09%
@Total C	Total C	376.00	449.00	73.00	18.50%	14.33%	1,350.50%	1,046.09%
Total C/73.0	Average C	5.15	6.15	1.00	0.25%	0.20%	18.50%	14.33%
@Total Plymouth Trench 1 -Average A-Average C - Average B	Total	2660.00	3030.00	370.00	1.01	0.79	33.45	25.91
Total/370.0	Average Value	7.19	8.19	1.00	0.27%	0.21%	9.04%	7.00%

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PLYMOUTH TRENCH 1
ASSAYS - UNIT SUBDIVISION

Formulas → / V		Fe2O3	Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	AL2O3	AL2O3*"Length (ft)" AlCalc	CaO
	Plymouth Trench 1							
	A							
	T1-1A	4.55%	68.25%	36.90%	553.50%	10.20%	153.00%	21.90%
	T1-1B	5.50%	82.50%	45.40%	681.00%	12.50%	187.50%	15.00%
	T1-1C	6.64%	132.80%	50.00%	1,000.00%	14.80%	296.00%	9.15%
	T1-2A	7.39%	36.95%	55.10%	275.50%	17.30%	86.50%	3.04%
	T1-2B	6.64%	39.84%	53.30%	319.80%	15.50%	93.00%	6.01%
	T1-3A	6.70%	194.30%	54.10%	1,568.90%	15.30%	443.70%	5.92%
	T1-3B	5.51%	165.30%	42.70%	1,281.00%	12.80%	384.00%	15.90%
	T1-4	6.99%	69.90%	55.20%	552.00%	16.60%	166.00%	4.35%
	T1-5	8.01%	32.04%	59.30%	237.20%	18.00%	72.00%	0.09%
	T1-6A	8.42%	151.56%	59.10%	1,063.80%	17.80%	320.40%	0.07%
	T1-6B	8.13%	219.51%	55.80%	1,506.60%	18.30%	494.10%	0.19%
	T1-7	9.32%	186.40%	52.30%	1,046.00%	18.30%	366.00%	0.41%
@Total A	Total A	83.80%	1,379.35%	619.20%	10,085.30%	187.40%	3,062.20%	82.03%
Total A/199	Average A	0.42%	6.93%	3.11%	50.68%	0.94%	15.39%	0.41%
	B							
	T1-8	26.80%	1,098.80%	27.50%	1,127.50%	6.08%	249.28%	2.52%
	T1-10	28.70%	602.70%	24.30%	510.30%	3.76%	78.96%	3.03%
	T1-10A	26.20%	52.40%	28.70%	57.40%	6.02%	12.04%	2.26%
	T1-11	37.20%	1,264.80%	18.20%	618.80%	3.48%	118.32%	3.58%
@total B	Total B	118.90%	3,018.70%	98.70%	2,314.00%	19.34%	458.60%	11.39%
total B / 98	Average B	1.21%	30.80%	1.01%	23.61%	0.20%	4.68%	0.12%
	C							
	T1-12	31.60%	2,306.80%	22.20%	1,620.60%	4.32%	315.36%	2.87%
@Total C	Total C	31.60%	2,306.80%	22.20%	1,620.60%	4.32%	315.36%	2.87%
Total C/73.0	Average C	0.43%	31.60%	0.30%	22.20%	0.06%	4.32%	0.04%
@Total Plymouth Trench 1 -Average A-Average C - Average B	Total	2.34	67.05	7.40	140.20	2.11	38.36	0.96
Total/370.0	Average Value	0.63%	18.12%	2.00%	37.89%	0.57%	10.37%	0.26%

PLYMOUTH TRENCH 1
ASSAYS - UNIT SUBDIVISION

Formulas →		CaO*"Length (ft)" CaCalc	MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc
	Plymouth Trench 1							
	A							
	T1-1A	328.50%	2.40%	36.00%	0.79%	11.85%	2.24%	33.60%
	T1-1B	225.00%	3.12%	46.80%	0.95%	14.25%	2.60%	39.00%
	T1-1C	183.00%	3.81%	76.20%	0.89%	17.80%	3.14%	62.80%
	T1-2A	15.20%	4.97%	24.85%	1.07%	5.35%	3.57%	17.85%
	T1-2B	36.06%	4.62%	27.72%	1.07%	6.42%	3.10%	18.60%
	T1-3A	171.68%	4.46%	129.34%	1.19%	34.51%	3.06%	88.74%
	T1-3B	477.00%	3.62%	108.60%	0.79%	23.70%	2.65%	79.50%
	T1-4	43.50%	4.31%	43.10%	1.42%	14.20%	3.11%	31.10%
	T1-5	0.36%	4.16%	16.64%	0.99%	3.96%	3.79%	15.16%
	T1-6A	1.26%	4.04%	72.72%	0.91%	16.38%	4.59%	82.62%
	T1-6B	5.13%	3.24%	87.48%	1.49%	40.23%	4.76%	128.52%
	T1-7	8.20%	1.13%	22.60%	2.63%	52.60%	4.35%	87.00%
@Total A	Total A	1,494.89%	43.88%	692.05%	14.19%	241.25%	40.96%	684.49%
Total A/199	Average A	7.51%	0.22%	3.48%	0.07%	1.21%	0.21%	3.44%
	B							
	T1-8	103.32%	2.71%	111.11%	0.06%	2.46%	0.37%	15.17%
	T1-10	63.63%	1.13%	23.73%	0.05%	1.05%	0.24%	5.04%
	T1-10A	4.52%	2.01%	4.02%	<0.01		0.19%	0.38%
	T1-11	121.72%	0.95%	32.30%	0.02%	0.68%	0.39%	13.26%
@total B	Total B	293.19%	6.80%	171.16%	0.13%	4.19%	1.19%	33.85%
total B / 98	Average B	2.99%	0.07%	1.75%	0.00%	0.04%	0.01%	0.35%
	C							
	T1-12	209.51%	0.95%	69.35%	0.21%	15.33%	0.44%	32.12%
@Total C	Total C	209.51%	0.95%	69.35%	0.21%	15.33%	0.44%	32.12%
Total C/73.0	Average C	2.87%	0.01%	0.95%	0.00%	0.21%	0.01%	0.44%
@Total Plymouth Trench 1 -Average A-Average C - Average B	Total	19.98	0.52	9.33	0.15	2.61	0.43	7.50
Total/370.0	Average Value	5.40%	0.14%	2.52%	0.04%	0.70%	0.12%	2.03%

PLYMOUTH TRENCH 1
ASSAYS - UNIT SUBDIVISION

Formulas → / V		TiO2	TiO2*"Length (ft)" TiCalc	P2O5	P2O5*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc	Sum
	Plymouth Trench 1							
	A							
	T1-1A	0.46%	6.90%	0.08%	1.20%	20.30%	304.50%	100.10%
	T1-1B	0.58%	8.70%	0.10%	1.50%	14.10%	211.50%	100.10%
	T1-1C	0.68%	13.60%	0.11%	2.20%	10.60%	212.00%	100.10%
	T1-2A	0.82%	4.10%	0.12%	0.60%	6.47%	32.35%	100.10%
	T1-2B	0.74%	4.44%	0.11%	0.66%	8.39%	50.34%	99.70%
	T1-3A	0.75%	21.75%	0.12%	3.48%	8.23%	238.67%	100.10%
	T1-3B	0.57%	17.10%	0.10%	3.00%	15.20%	456.00%	100.10%
	T1-4	0.78%	7.80%	0.11%	1.10%	7.08%	70.80%	100.40%
	T1-5	0.75%	3.00%	0.05%	0.20%	4.47%	17.88%	100.00%
	T1-6A	0.77%	13.86%	0.05%	0.90%	3.93%	70.74%	100.10%
	T1-6B	0.76%	20.52%	0.07%	1.89%	4.47%	120.69%	99.50%
	T1-7	0.83%	16.60%	0.06%	1.20%	4.39%	87.80%	99.30%
@Total A	Total A	8.49%	138.37%	1.08%	17.93%	107.63%	1,873.27%	1,199.60%
Total A/199	Average A	0.04%	0.70%	0.01%	0.09%	0.54%	9.41%	6.03%
	B							
	T1-8	0.24%	9.84%	1.30%	53.30%	15.40%	631.40%	100.10%
	T1-10	0.19%	3.99%	1.74%	36.54%	17.50%	367.50%	99.80%
	T1-10A	0.23%	0.46%	1.21%	2.42%	15.50%	31.00%	100.20%
	T1-11	0.13%	4.42%	1.99%	67.66%	14.50%	493.00%	100.20%
@total B	Total B	0.79%	18.71%	6.24%	159.92%	62.90%	1,522.90%	400.30%
total B / 98	Average B	0.01%	0.19%	0.06%	1.63%	0.64%	15.54%	4.08%
	C							
	T1-12	0.17%	12.41%	1.41%	102.93%	17.50%	1,277.50%	100.30%
@Total C	Total C	0.17%	12.41%	1.41%	102.93%	17.50%	1,277.50%	100.30%
Total C/73.0	Average C	0.00%	0.17%	0.02%	1.41%	0.24%	17.50%	1.37%
@Total Plymouth Trench 1 -Average A-Average C - Average B	Total	0.09	1.69	0.09	2.81	1.88	46.74	17.00
Total/370.0	Average Value	0.03%	0.46%	0.02%	0.76%	0.51%	12.63%	4.60%

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PLYMOUTH TRENCH 1
ASSAYS - UNIT SUBDIVISION

Formulas →		Sum*"Length (ft)" SumCalc
	Plymouth Trench 1	
	A	
	T1-1A	1,501.50
	T1-1B	1,501.50
	T1-1C	2,002.00
	T1-2A	500.50
	T1-2B	598.20
	T1-3A	2,902.90
	T1-3B	3,003.00
	T1-4	1,004.00
	T1-5	400.00
	T1-6A	1,801.80
	T1-6B	2,686.50
	T1-7	1,986.00
@Total A	Total A	19,887.90
Total A/199	Average A	99.94
	B	
	T1-8	4,104.10
	T1-10	2,095.80
	T1-10A	200.40
	T1-11	3,406.80
@total B	Total B	9,807.10
total B / 98	Average B	100.07
	C	
	T1-12	7,321.90
@Total C	Total C	7,321.90
Total C/73.0	Average C	100.30
@Total Plymouth Trench 1 -Average A-Average C - Average B	Total	370.17
Total/370.0	Average Value	100.05

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas → / V		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnOCalc	Mn*"Length (ft)" MnCalc
	Plymouth Trench 2							
	A							
	T2-1	-25.00	0.00	25.00	0.40%	0.31%	10.00%	7.75%
	T2-2	0.00	25.00	25.00	1.12%	0.87%	28.00%	21.69%
@Total A	Total A	-25.00	25.00	50.00	1.52%	1.18%	38.00%	29.43%
Total A/50	Average A	-0.50	0.50	1.00	0.03%	0.02%	0.76%	0.59%
	B							
	T2-3	25.00	50.00	25.00	9.21%	7.13%	230.25%	178.35%
	T2-4	50.00	77.00	27.00	7.72%	5.98%	208.44%	161.46%
@Total B	Total B	75.00	127.00	52.00	16.93%	13.11%	438.69%	339.81%
Total B/52	Average B	1.44	2.44	1.00	0.33%	0.25%	8.44%	6.53%
	C							
	T2-6	100.00	125.00	25.00	13.10%	10.15%	327.50%	253.68%
	T2-7	125.00	150.00	25.00	12.80%	9.91%	320.00%	247.87%
@Total C	Total C	225.00	275.00	50.00	25.90%	20.06%	647.50%	501.55%
Total C/50	Average C	4.50	5.50	1.00	0.52%	0.40%	12.95%	10.03%
	D							
	T2-8	150.00	175.00	25.00	8.22%	6.37%	205.50%	159.18%
	T2-9	175.00	200.00	25.00	7.69%	5.96%	192.25%	148.92%
	T2-10	200.00	230.00	30.00	11.80%	9.14%	354.00%	274.21%
@Total D	Total D	525.00	605.00	80.00	27.71%	21.46%	751.75%	582.30%
Total D/80	Average D	6.56	7.56	1.00	0.35%	0.27%	9.40%	7.28%
	E							
	T2-11	230.00	238.00	8.00	17.80%	13.79%	142.40%	110.30%
	T2-12	238.00	259.00	21.00	19.40%	15.03%	407.40%	315.57%
	T2-13	259.00	280.00	21.00	14.70%	11.39%	308.70%	239.12%
@Total E	Total E	727.00	777.00	50.00	51.90%	40.20%	858.50%	664.99%
Total E/50	Average E	14.54	15.54	1.00	1.04%	0.80%	17.17%	13.30%

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas → / V		Fe2O3	Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	Al2O3	Al2O3*"Length (ft)" AlCalc	CaO
	Plymouth Trench 2							
	A							
	T2-1	5.96%	149.00%	48.60%	1,215.00%	14.10%	352.50%	10.90%
	T2-2	7.92%	198.00%	57.60%	1,440.00%	18.30%	457.50%	0.17%
@Total A	Total A	13.88%	347.00%	106.20%	2,655.00%	32.40%	810.00%	11.07%
Total A/50	Average A	0.28%	6.94%	2.12%	53.10%	0.65%	16.20%	0.22%
	B							
	T2-3	18.90%	472.50%	41.40%	1,035.00%	13.40%	335.00%	1.54%
	T2-4	12.00%	324.00%	47.00%	1,269.00%	15.30%	413.10%	0.81%
@Total B	Total B	30.90%	796.50%	88.40%	2,304.00%	28.70%	748.10%	2.35%
Total B/52	Average B	0.59%	15.32%	1.70%	44.31%	0.55%	14.39%	0.05%
	C							
	T2-6	20.90%	522.50%	35.70%	892.50%	10.30%	257.50%	3.62%
	T2-7	22.40%	560.00%	35.50%	887.50%	11.50%	287.50%	2.06%
@Total C	Total C	43.30%	1,082.50%	71.20%	1,780.00%	21.80%	545.00%	5.68%
Total C/50	Average C	0.87%	21.65%	1.42%	35.60%	0.44%	10.90%	0.11%
	D							
	T2-8	10.90%	272.50%	47.00%	1,175.00%	16.10%	402.50%	1.01%
	T2-9	16.30%	407.50%	46.50%	1,162.50%	14.90%	372.50%	0.91%
	T2-10	20.80%	624.00%	36.80%	1,104.00%	11.50%	345.00%	1.97%
@Total D	Total D	48.00%	1,304.00%	130.30%	3,441.50%	42.50%	1,120.00%	3.89%
Total D/80	Average D	0.60%	16.30%	1.63%	43.02%	0.53%	14.00%	0.05%
	E							
	T2-11	30.60%	244.80%	19.50%	156.00%	5.65%	45.20%	3.33%
	T2-12	31.50%	661.50%	22.00%	462.00%	6.86%	144.06%	3.47%
	T2-13	28.60%	600.60%	28.10%	590.10%	8.88%	186.48%	2.53%
@Total E	Total E	90.70%	1,506.90%	69.60%	1,208.10%	21.39%	375.74%	9.33%
Total E/50	Average E	1.81%	30.14%	1.39%	24.16%	0.43%	7.51%	0.19%

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas →		CaO*"Length (ft)" CaCalc	MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc
	Plymouth Trench 2							
	A							
	T2-1	272.50%	4.26%	106.50%	0.90%	22.50%	2.68%	67.00%
	T2-2	4.25%	3.69%	92.25%	0.89%	22.25%	5.02%	125.50%
@Total A	Total A	276.75%	7.95%	198.75%	1.79%	44.75%	7.70%	192.50%
Total A/50	Average A	5.54%	0.16%	3.98%	0.04%	0.90%	0.15%	3.85%
	B							
	T2-3	38.50%	2.62%	65.50%	0.57%	14.25%	3.68%	92.00%
	T2-4	21.87%	3.27%	88.29%	1.76%	47.52%	3.50%	94.50%
@Total B	Total B	60.37%	5.89%	153.79%	2.33%	61.77%	7.18%	186.50%
Total B/52	Average B	1.16%	0.11%	2.96%	0.04%	1.19%	0.14%	3.59%
	C							
	T2-6	90.50%	2.19%	54.75%	1.51%	37.75%	1.67%	41.75%
	T2-7	51.50%	2.40%	60.00%	1.57%	39.25%	2.03%	50.75%
@Total C	Total C	142.00%	4.59%	114.75%	3.08%	77.00%	3.70%	92.50%
Total C/50	Average C	2.84%	0.09%	2.30%	0.06%	1.54%	0.07%	1.85%
	D							
	T2-8	25.25%	3.00%	75.00%	3.80%	95.00%	2.71%	67.75%
	T2-9	22.75%	2.94%	73.50%	1.09%	27.25%	4.02%	100.50%
	T2-10	59.10%	2.96%	88.80%	1.25%	37.50%	2.50%	75.00%
@Total D	Total D	107.10%	8.90%	237.30%	6.14%	159.75%	9.23%	243.25%
Total D/80	Average D	1.34%	0.11%	2.97%	0.08%	2.00%	0.12%	3.04%
	E							
	T2-11	26.64%	1.48%	11.84%	0.35%	2.80%	0.85%	6.80%
	T2-12	72.87%	1.33%	27.93%	0.71%	14.91%	0.63%	13.23%
	T2-13	53.13%	1.76%	36.96%	0.96%	20.16%	1.34%	28.14%	
@Total E	Total E	152.64%	4.57%	76.73%	2.02%	37.87%	2.82%	48.17%
Total E/50	Average E	3.05%	0.09%	1.53%	0.04%	0.76%	0.06%	0.96%

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas → / V		TiO2	TiO2*"Length (ft)" TiCalc	P2O5	P2O5*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc	Sum
	Plymouth Trench 2							
	A							
	T2-1	0.63%	15.75%	0.10%	2.50%	11.50%	287.50%	100.10%
	T2-2	0.80%	20.00%	0.07%	1.75%	4.39%	109.75%	100.10%
@Total A	Total A	1.43%	35.75%	0.17%	4.25%	15.89%	397.25%	200.20%
Total A/50	Average A	0.03%	0.72%	0.00%	0.09%	0.32%	7.95%	4.00%
	B							
	T2-3	0.60%	15.00%	0.70%	17.50%	7.16%	179.00%	100.00%
	T2-4	0.66%	17.82%	0.28%	7.56%	6.00%	162.00%	98.50%
@Total B	Total B	1.26%	32.82%	0.98%	25.06%	13.16%	341.00%	198.50%
Total B/52	Average B	0.02%	0.63%	0.02%	0.48%	0.25%	6.56%	3.82%
	C							
	T2-6	0.45%	11.25%	0.85%	21.25%	9.47%	236.75%	99.90%
	T2-7	0.49%	12.25%	0.98%	24.50%	8.16%	204.00%	100.00%
@Total C	Total C	0.94%	23.50%	1.83%	45.75%	17.63%	440.75%	199.90%
Total C/50	Average C	0.02%	0.47%	0.04%	0.92%	0.35%	8.82%	4.00%
	D							
	T2-8	0.68%	17.00%	0.36%	9.00%	4.39%	109.75%	98.80%
	T2-9	0.63%	15.75%	0.51%	12.75%	3.47%	86.75%	99.10%
	T2-10	0.50%	15.00%	0.93%	27.90%	9.31%	279.30%	100.60%
@Total D	Total D	1.81%	47.75%	1.80%	49.65%	17.17%	475.80%	298.50%
Total D/80	Average D	0.02%	0.60%	0.02%	0.62%	0.21%	5.95%	3.73%
	E							
	T2-11	0.25%	2.00%	1.51%	12.08%	18.80%	150.40%	100.30%
	T2-12	0.32%	6.72%	1.51%	31.71%	12.20%	256.20%	100.10%
	T2-13	0.38%	7.98%	1.24%	26.04%	11.50%	241.50%	100.10%
@Total E	Total E	0.95%	16.70%	4.26%	69.83%	42.50%	648.10%	300.50%
Total E/50	Average E	0.02%	0.33%	0.09%	1.40%	0.85%	12.96%	6.01%

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas		>Sum*"Length (ft)" SumCalc
	Plymouth Trench 2	
	A	
	T2-1	2,502.50%
	T2-2	2,502.50%
@Total A	Total A	5,005.00%
Total A/50	Average A	100.10%
	B	
	T2-3	2,500.00%
	T2-4	2,659.50%
@Total B	Total B	5,159.50%
Total B/52	Average B	99.22%
	C	
	T2-6	2,497.50%
	T2-7	2,500.00%
@Total C	Total C	4,997.50%
Total C/50	Average C	99.95%
	D	
	T2-8	2,470.00%
	T2-9	2,477.50%
	T2-10	3,018.00%
@Total D	Total D	7,965.50%
Total D/80	Average D	99.57%
	E	
	T2-11	802.40%
	T2-12	2,102.10%
	T2-13	2,102.10%
@Total E	Total E	5,006.60%
Total E/50	Average E	100.13%

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas → / V		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnOCalc	Mn*"Length (ft)" MnCalc
	F							
	T2-14	280.00	298.00	18.00	10.30%	7.98%	185.40%	143.61%
	T2-15	298.00	311.00	13.00	10.80%	8.37%	140.40%	108.75%
	T2-16	311.00	334.00	23.00	14.00%	10.84%	322.00%	249.42%
	T2-17	334.00	357.00	23.00	20.30%	15.72%	466.90%	361.66%
	T2-18A	357.00	370.00	13.00	14.90%	11.54%	193.70%	150.04%
	T2-18B	370.00	379.00	9.00	24.40%	18.90%	219.60%	170.10%
	T2-19	379.00	401.00	22.00	13.10%	10.15%	288.20%	223.24%
	T2-20	401.00	431.00	30.00	9.84%	7.62%	295.20%	228.66%
	T2-21	431.00	462.00	31.00	12.00%	9.30%	372.00%	288.15%
	T2-22	462.00	468.00	6.00	11.10%	8.60%	66.60%	51.59%
	T2-23	468.00	476.00	8.00	6.77%	5.24%	54.16%	41.95%
	T2-24A	476.00	486.00	10.00	6.23%	4.83%	62.30%	48.26%
@Total F	Total F	4567.00	4773.00	206.00	153.74%	119.09%	2,666.46%	2,065.42%
Total F/206	Average F	22.17	23.17	1.00	0.75%	0.58%	12.94%	10.03%
	G							
	T2-24B	486.00	497.00	11.00	17.50%	13.56%	192.50%	149.11%
	T2-25	497.00	525.00	28.00	16.20%	12.55%	453.60%	351.36%
	T2-26	525.00	550.00	25.00	17.70%	13.71%	442.50%	342.76%
	T2-27	550.00	575.00	25.00	15.50%	12.01%	387.50%	300.15%
	T2-28	575.00	600.00	25.00	21.00%	16.27%	525.00%	406.66%
	T2-29	600.00	616.00	16.00	19.70%	15.26%	315.20%	244.15%
	T2-30	616.00	641.00	25.00	15.80%	12.24%	395.00%	305.96%
	T2-31	641.00	667.00	26.00	18.30%	14.18%	475.80%	368.55%
@Total G	Total G	4490.00	4671.00	181.00	141.70%	109.76%	3,187.10%	2,468.71%
Total G/181	Average G	24.81	25.81	1.00	0.78%	0.61%	17.61%	13.64%

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas → / V		Fe2O3	Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	Al2O3	Al2O3*"Length (ft)" AlCalc	CaO
	F							
	T2-14	20.30%	365.40%	36.30%	653.40%	12.70%	228.60%	1.60%
	T2-15	16.40%	213.20%	40.10%	521.30%	13.10%	170.30%	1.21%
	T2-16	27.30%	627.90%	24.50%	563.50%	8.46%	194.58%	2.56%
	T2-17	28.00%	644.00%	17.80%	409.40%	4.88%	112.24%	3.29%
	T2-18A	28.30%	367.90%	22.60%	293.80%	6.41%	83.33%	2.57%
	T2-18B	31.30%	281.70%	16.70%	150.30%	3.78%	34.02%	4.92%
	T2-19	25.20%	554.40%	32.80%	721.60%	11.20%	246.40%	2.70%
	T2-20	21.40%	642.00%	38.90%	1,167.00%	12.20%	366.00%	2.45%
	T2-21	24.80%	768.80%	34.30%	1,063.30%	11.10%	344.10%	1.71%
	T2-22	19.00%	114.00%	36.10%	216.60%	13.90%	83.40%	1.24%
	T2-23	8.19%	65.52%	48.10%	384.80%	17.70%	141.60%	0.34%
	T2-24A	13.30%	133.00%	45.60%	456.00%	16.60%	166.00%	0.70%
@Total F	Total F	263.49%	4,777.82%	393.80%	6,601.00%	132.03%	2,170.57%	25.29%
Total F/206	Average F	1.28%	23.19%	1.91%	32.04%	0.64%	10.54%	0.12%
	G							
	T2-24B	25.40%	279.40%	26.20%	288.20%	8.41%	92.51%	2.23%
	T2-25	32.60%	912.80%	19.30%	540.40%	5.54%	155.12%	3.15%
	T2-26	25.30%	632.50%	23.40%	585.00%	7.82%	195.50%	2.37%
	T2-27	25.40%	635.00%	28.00%	700.00%	7.87%	196.75%	2.43%
	T2-28	30.20%	755.00%	20.00%	500.00%	3.83%	95.75%	3.20%
	T2-29	30.50%	488.00%	20.30%	324.80%	4.02%	64.32%	3.36%
	T2-30	22.90%	572.50%	31.10%	777.50%	8.93%	223.25%	2.25%
	T2-31	30.90%	803.40%	22.00%	572.00%	5.88%	152.88%	2.83%
@Total G	Total G	223.20%	5,078.60%	190.30%	4,287.90%	52.30%	1,176.08%	21.82%
Total G/181	Average G	1.23%	28.06%	1.05%	23.69%	0.29%	6.50%	0.12%

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas →		CaO*"Length (ft)" CaCalc	MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc
	F							
	T2-14	28.80%	2.35%	42.30%	2.27%	40.86%	2.13%	38.34%
	T2-15	15.73%	2.65%	34.45%	1.55%	20.15%	3.16%	41.08%
	T2-16	58.88%	1.86%	42.78%	0.36%	8.28%	1.62%	37.26%
	T2-17	75.67%	1.62%	37.26%	0.08%	1.84%	0.84%	19.32%
	T2-18A	33.41%	2.05%	26.65%	0.42%	5.46%	1.00%	13.00%
	T2-18B	44.28%	0.92%	8.28%	<0.01		0.09%	0.81%
	T2-19	59.40%	2.02%	44.44%	1.04%	22.88%	1.89%	41.58%
	T2-20	73.50%	2.42%	72.60%	2.71%	81.30%	1.82%	54.60%
	T2-21	53.01%	2.00%	62.00%	0.94%	29.14%	3.14%	97.34%
	T2-22	7.44%	2.37%	14.22%	0.84%	5.04%	3.99%	23.94%
	T2-23	2.72%	1.86%	14.88%	1.51%	12.08%	5.21%	41.68%
	T2-24A	7.00%	1.46%	14.60%	0.59%	5.90%	5.03%	50.30%
@Total F	Total F	459.84%	23.58%	414.46%	12.31%	232.93%	29.92%	459.25%
Total F/206	Average F	2.23%	0.11%	2.01%	0.06%	1.13%	0.15%	2.23%
	G							
	T2-24B	24.53%	2.04%	22.44%	0.38%	4.18%	0.83%	9.13%
	T2-25	88.20%	1.54%	43.12%	0.10%	2.80%	0.71%	19.88%
	T2-26	59.25%	3.10%	77.50%	0.03%	0.75%	1.01%	25.25%
	T2-27	60.75%	3.60%	90.00%	0.19%	4.75%	0.52%	13.00%
	T2-28	80.00%	0.99%	24.75%	0.02%	0.50%	0.80%	20.00%
	T2-29	53.76%	1.14%	18.24%	0.16%	2.56%	0.55%	8.80%
	T2-30	56.25%	1.84%	46.00%	1.74%	43.50%	1.61%	40.25%
	T2-31	73.58%	1.64%	42.64%	0.98%	25.48%	1.13%	29.38%
@Total G	Total G	496.32%	15.89%	364.69%	3.60%	84.52%	7.16%	165.69%
Total G/181	Average G	2.74%	0.09%	2.01%	0.02%	0.47%	0.04%	0.92%

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PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas → / V		TiO2	TiO2*"Length (ft)" TiCalc	P2O5	P2O5*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc	Sum
	F							
	T2-14	0.55%	9.90%	0.69%	12.42%	10.40%	187.20%	99.70%
	T2-15	0.55%	7.15%	0.55%	7.15%	9.00%	117.00%	99.30%
	T2-16	0.37%	8.51%	1.26%	28.98%	17.60%	404.80%	100.00%
	T2-17	0.22%	5.06%	1.16%	26.68%	21.80%	501.40%	100.10%
	T2-18A	0.31%	4.03%	1.11%	14.43%	20.00%	260.00%	99.80%
	T2-18B	0.17%	1.53%	1.72%	15.48%	15.90%	143.10%	100.00%
	T2-19	0.49%	10.78%	1.20%	26.40%	8.47%	186.34%	100.30%
	T2-20	0.52%	15.60%	0.83%	24.90%	6.31%	189.30%	99.70%
	T2-21	0.49%	15.19%	0.79%	24.49%	8.77%	271.87%	100.30%
	T2-22	0.60%	3.60%	0.66%	3.96%	10.20%	61.20%	100.20%
	T2-23	0.75%	6.00%	0.07%	0.56%	8.77%	70.16%	99.50%
	T2-24A	0.68%	6.80%	0.38%	3.80%	9.08%	90.80%	99.80%
@Total F	Total F	5.70%	94.15%	10.42%	189.25%	146.30%	2,483.17%	1,198.70%
Total F/206	Average F	0.03%	0.46%	0.05%	0.92%	0.71%	12.05%	5.82%
	G							
	T2-24B	0.39%	4.29%	1.11%	12.21%	15.30%	168.30%	99.90%
	T2-25	0.27%	7.56%	1.78%	49.84%	18.90%	529.20%	100.20%
	T2-26	0.34%	8.50%	1.28%	32.00%	17.90%	447.50%	100.30%
	T2-27	0.33%	8.25%	1.15%	28.75%	15.20%	380.00%	100.30%
	T2-28	0.13%	3.25%	1.46%	36.50%	18.60%	465.00%	100.30%
	T2-29	0.19%	3.04%	1.40%	22.40%	18.60%	297.60%	100.00%
	T2-30	0.39%	9.75%	0.90%	22.50%	12.30%	307.50%	100.00%
	T2-31	0.26%	6.76%	1.33%	34.58%	14.80%	384.80%	100.20%
@Total G	Total G	2.30%	51.40%	10.41%	238.78%	131.60%	2,979.90%	801.20%
Total G/181	Average G	0.01%	0.28%	0.06%	1.32%	0.73%	16.46%	4.43%

PLYMOUTH TRENCH 2
ASSAYS - UNIT SUBDIVISION

Formulas →		Sum*"Length (ft)" SumCalc
	F	
	T2-14	1,794.60%
	T2-15	1,290.90%
	T2-16	2,300.00%
	T2-17	2,302.30%
	T2-18A	1,297.40%
	T2-18B	900.00%
	T2-19	2,206.60%
	T2-20	2,991.00%
	T2-21	3,109.30%
	T2-22	601.20%
	T2-23	796.00%
	T2-24A	998.00%
@Total F	Total F	20,587.30%
Total F/206	Average F	99.94%
	G	
	T2-24B	1,098.90%
	T2-25	2,805.60%
	T2-26	2,507.50%
	T2-27	2,507.50%
	T2-28	2,507.50%
	T2-29	1,600.00%
	T2-30	2,500.00%
	T2-31	2,605.20%
@Total G	Total G	18,132.20%
Total G/181	Average G	100.18%

Maritime Resource Research Limited

PLYMOUTH DDH-87-2
ASSAYS - UNIT SUBDIVISION

Formulas →		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnOCalc	Mn*"Length (ft)" MnCalc	Fe2O3
	Plymouth DDH-87-2								
	A								
	DDH-87-2-28	28.00	38.00	10.00	0.12%	0.09%	1.20%	0.93%	5.03%
	DDH-87-2-46	46.00	50.42	4.42	0.19%	0.15%	0.84%	0.65%	7.71%
	DDH-87-2-50	50.42	76.00	25.58	0.66%	0.51%	16.88%	13.08%	8.19%
	DDH-87-2-76	76.00	96.00	20.00	3.51%	2.72%	70.20%	54.38%	8.63%
	DDH-87-2-96	96.00	106.00	10.00	8.12%	6.29%	81.20%	62.90%	14.20%
@Total A	Total A	296.42	366.42	70.00	12.60%	9.76%	170.32%	131.93%	43.76%
Total A/70.00	Avg A	4.23	5.23	1.00	0.18%	0.14%	2.43%	1.88%	0.63%
	B								
	DDH-87-2-106	106.00	116.00	10.00	14.50%	11.23%	145.00%	112.32%	29.00%
	DDH-87-2-116	116.00	136.00	20.00	10.30%	7.98%	206.00%	159.57%	19.90%
	DDH-87-2-136	136.00	146.00	10.00	14.50%	11.23%	145.00%	112.32%	20.50%
	DDH-87-2-146	146.00	156.00	10.00	14.70%	11.39%	147.00%	113.87%	17.90%
	DDH-87-2-156	156.00	166.00	10.00	10.60%	8.21%	106.00%	82.11%	17.30%
	DDH-87-2-166	166.00	186.00	20.00	8.95%	6.93%	179.00%	138.65%	14.30%
	DDH-87-2-186	186.00	194.00	8.00	14.00%	10.84%	112.00%	86.75%	16.00%
	DDH-87-2-194	194.00	200.00	6.00	19.40%	15.03%	116.40%	90.16%	19.00%
	DDH-87-2-200	200.00	210.00	10.00	17.40%	13.48%	174.00%	134.78%	26.30%
	DDH-87-2-210	210.00	220.00	10.00	16.30%	12.63%	163.00%	126.26%	28.80%
	DDH-87-2-220	220.00	230.00	10.00	12.50%	9.68%	125.00%	96.82%	19.10%
	DDH-87-2-230	230.00	240.00	10.00	15.80%	12.24%	158.00%	122.39%	26.40%
	DDH-87-2-240	240.00	260.00	20.00	20.40%	15.80%	408.00%	316.03%	31.50%
	DDH-87-2-260	260.00	272.00	12.00	11.60%	8.99%	139.20%	107.82%	19.20%
	DDH-87-2-272	272.00	282.00	10.00	6.80%	5.27%	68.00%	52.67%	15.90%
	DDH-87-2-282	282.00	292.58	10.58	18.00%	13.94%	190.44%	147.51%	28.70%
	DDH-87-2-292	292.58	306.00	13.42	16.50%	12.78%	221.43%	171.52%	38.90%
	DDH-87-2-306	306.00	324.00	18.00	11.10%	8.60%	199.80%	154.76%	21.60%
	DDH-87-2-324	324.00	334.00	10.00	11.10%	8.60%	111.00%	85.98%	22.50%
@Total B	Total B	4042.58	4270.58	228.00	264.45%	204.84%	3,114.27%	2,412.29%	432.80%
Total B/228.00	Avg B	17.73	18.73	1.00	1.16%	0.90%	13.66%	10.58%	1.90%

Maritime Resource Research Limited

PLYMOUTH DDH-87-2
ASSAYS - UNIT SUBDIVISION

Formulas ->Fe203*"Length (ft)" FeCalc		Si02	Si02*"Length (ft)" SiCalc	Al203	Al203*"Length (ft)" AlCalc	CaO	CaO*"Length (ft)" CaCalc
	Plymouth DDH-87-2						
	A						
	DDH-87-2-28	50.30%	38.80%	388.00%	11.80%	118.00%	19.60%	196.00%
	DDH-87-2-46	34.08%	60.00%	265.20%	17.50%	77.35%	0.67%	2.96%
	DDH-87-2-50	209.50%	58.20%	1,488.76%	18.30%	468.11%	0.23%	5.88%
	DDH-87-2-76	172.60%	54.00%	1,080.00%	17.80%	356.00%	0.30%	6.00%
	DDH-87-2-96	142.00%	44.70%	447.00%	14.70%	147.00%	1.04%	10.40%
@Total A	Total A	608.48%	255.70%	3,668.96%	80.10%	1,166.46%	21.84%	221.24%
Total A/70.00	Avg A	8.69%	3.65%	52.41%	1.14%	16.66%	0.31%	3.16%
	B							
	DDH-87-2-106	290.00%	31.30%	313.00%	9.95%	99.50%	2.68%	26.80%
	DDH-87-2-116	398.00%	40.20%	804.00%	12.70%	254.00%	1.68%	33.60%
	DDH-87-2-136	205.00%	32.70%	327.00%	10.40%	104.00%	3.32%	33.20%
	DDH-87-2-146	179.00%	29.90%	299.00%	11.50%	115.00%	4.57%	45.70%
	DDH-87-2-156	173.00%	36.60%	366.00%	11.40%	114.00%	4.66%	46.60%
	DDH-87-2-166	286.00%	43.00%	860.00%	13.60%	272.00%	1.32%	26.40%
	DDH-87-2-186	128.00%	31.40%	251.20%	8.86%	70.88%	1.54%	12.32%
	DDH-87-2-194	114.00%	25.40%	152.40%	7.66%	45.96%	2.70%	16.20%
	DDH-87-2-200	263.00%	22.00%	220.00%	5.68%	56.80%	2.72%	27.20%
	DDH-87-2-210	288.00%	20.50%	205.00%	5.12%	51.20%	3.25%	32.50%
	DDH-87-2-220	191.00%	32.90%	329.00%	11.70%	117.00%	1.73%	17.30%
	DDH-87-2-230	264.00%	24.30%	243.00%	7.66%	76.60%	2.38%	23.80%
	DDH-87-2-240	630.00%	15.80%	316.00%	5.45%	109.00%	3.84%	76.80%
	DDH-87-2-260	230.40%	34.20%	410.40%	10.70%	128.40%	3.58%	42.96%
	DDH-87-2-272	159.00%	41.90%	419.00%	14.00%	140.00%	1.64%	16.40%
	DDH-87-2-282	303.65%	23.60%	249.69%	7.57%	80.09%	3.09%	32.69%
	DDH-87-2-292	522.04%	15.90%	213.38%	4.38%	58.78%	4.52%	60.66%
	DDH-87-2-306	388.80%	34.60%	622.80%	9.11%	163.98%	2.66%	47.88%
	DDH-87-2-324	225.00%	34.60%	346.00%	11.60%	116.00%	1.42%	14.20%
@Total B	Total B	5,237.88%	570.80%	6,946.87%	179.04%	2,173.19%	53.30%	633.21%
Total B/228.00	Avg B	22.97%	2.50%	30.47%	0.79%	9.53%	0.23%	2.78%

Maritime Resource Research Limited

PLYMOUTH DDH-87-2
ASSAYS - UNIT SUBDIVISION

Formulas → / V		MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc	TiO2	TiO2*"Length (ft)" TiCalc
	Plymouth DDH-87-2								
	A								
	DDH-87-2-28	3.38%	33.80%	0.76%	7.60%	2.35%	23.50%	0.50%	5.00%
	DDH-87-2-46	4.12%	18.21%	1.10%	4.86%	3.64%	16.09%	0.74%	3.27%
	DDH-87-2-50	4.08%	104.37%	0.85%	21.74%	4.74%	121.25%	0.78%	19.95%
	DDH-87-2-76	3.68%	73.60%	1.29%	25.80%	4.55%	91.00%	0.75%	15.00%
	DDH-87-2-96	2.91%	29.10%	1.94%	19.40%	3.12%	31.20%	0.60%	6.00%
@Total A	Total A	18.17%	259.08%	5.94%	79.41%	18.40%	283.04%	3.37%	49.22%
Total A/70.00	Avg A	0.26%	3.70%	0.08%	1.13%	0.26%	4.04%	0.05%	0.70%
	B								
	DDH-87-2-106	2.53%	25.30%	0.99%	9.90%	1.96%	19.60%	0.43%	4.30%
	DDH-87-2-116	2.62%	52.40%	1.74%	34.80%	2.65%	53.00%	0.54%	10.80%
	DDH-87-2-136	2.15%	21.50%	2.44%	24.40%	1.68%	16.80%	0.45%	4.50%
	DDH-87-2-146	2.15%	21.50%	1.88%	18.80%	1.87%	18.70%	0.50%	5.00%
	DDH-87-2-156	2.56%	25.60%	2.15%	21.50%	2.00%	20.00%	0.49%	4.90%
	DDH-87-2-166	2.85%	57.00%	0.68%	13.60%	3.61%	72.20%	0.57%	11.40%
	DDH-87-2-186	4.57%	36.56%	0.17%	1.36%	2.03%	16.24%	0.42%	3.36%
	DDH-87-2-194	4.33%	25.98%	0.09%	0.54%	0.83%	4.98%	0.37%	2.22%
	DDH-87-2-200	2.64%	26.40%	0.01%	0.10%	0.61%	6.10%	0.27%	2.70%
	DDH-87-2-210	2.05%	20.50%	0.09%	0.90%	0.63%	6.30%	0.24%	2.40%
	DDH-87-2-220	2.72%	27.20%	1.64%	16.40%	1.66%	16.60%	0.51%	5.10%
	DDH-87-2-230	1.86%	18.60%	0.51%	5.10%	1.29%	12.90%	0.35%	3.50%
	DDH-87-2-240	1.51%	30.20%	0.25%	5.00%	0.60%	12.00%	0.26%	5.20%
	DDH-87-2-260	2.04%	24.48%	0.07%	0.84%	3.06%	36.72%	0.46%	5.52%
	DDH-87-2-272	2.58%	25.80%	0.13%	1.30%	4.00%	40.00%	0.62%	6.20%
	DDH-87-2-282	1.48%	15.66%	<0.01		1.53%	16.19%	0.33%	3.49%
	DDH-87-2-292	1.10%	14.76%	0.06%	0.81%	0.73%	9.80%	0.21%	2.82%
	DDH-87-2-306	1.77%	31.86%	0.23%	4.14%	2.44%	43.92%	0.38%	6.84%
	DDH-87-2-324	4.83%	48.30%	0.49%	4.90%	0.55%	5.50%	0.51%	5.10%
@Total B	Total B	48.34%	549.60%	13.62%	164.39%	33.73%	427.54%	7.91%	95.35%
Total B/228.00	Avg B	0.21%	2.41%	0.06%	0.72%	0.15%	1.88%	0.03%	0.42%

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PLYMOUTH DDH-87-2
ASSAYS - UNIT SUBDIVISION

Formulas → / V		P205	P205*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc	Sum	Sum*"Length (ft)" SumCalc
	Plymouth DDH-87-2						
	A						
	DDH-87-2-28	0.10%	1.00%	17.70%	177.00%	100.30%	1,003.00%
	DDH-87-2-46	0.05%	0.22%	4.23%	18.70%	100.10%	442.44%
	DDH-87-2-50	0.07%	1.79%	4.23%	108.20%	100.50%	2,570.79%
	DDH-87-2-76	0.08%	1.60%	4.85%	97.00%	99.60%	1,992.00%
	DDH-87-2-96	0.43%	4.30%	6.46%	64.60%	98.50%	985.00%
@Total A	Total A	0.73%	8.91%	37.47%	465.50%	499.00%	6,993.23%
Total A/70.00	Avg A	0.01%	0.13%	0.54%	6.65%	7.13%	99.90%
	B						
	DDH-87-2-106	1.34%	13.40%	5.31%	53.10%	100.10%	1,001.00%
	DDH-87-2-116	0.68%	13.60%	5.16%	103.20%	98.50%	1,970.00%
	DDH-87-2-136	0.87%	8.70%	9.24%	92.40%	98.90%	989.00%
	DDH-87-2-146	0.63%	6.30%	12.50%	125.00%	98.50%	985.00%
	DDH-87-2-156	0.80%	8.00%	10.90%	109.00%	99.80%	998.00%
	DDH-87-2-166	0.45%	9.00%	9.70%	194.00%	99.20%	1,984.00%
	DDH-87-2-186	0.69%	5.52%	20.20%	161.60%	100.00%	800.00%
	DDH-87-2-194	1.19%	7.14%	19.20%	115.20%	100.20%	601.20%
	DDH-87-2-200	1.20%	12.00%	21.10%	211.00%	100.00%	1,000.00%
	DDH-87-2-210	1.56%	15.60%	21.70%	217.00%	100.30%	1,003.00%
	DDH-87-2-220	0.68%	6.80%	14.70%	147.00%	100.00%	1,000.00%
	DDH-87-2-230	1.12%	11.20%	18.20%	182.00%	100.00%	1,000.00%
	DDH-87-2-240	1.66%	33.20%	18.30%	366.00%	99.70%	1,994.00%
	DDH-87-2-260	0.88%	10.56%	12.90%	154.80%	98.90%	1,186.80%
	DDH-87-2-272	0.59%	5.90%	11.60%	116.00%	99.90%	999.00%
	DDH-87-2-282	1.53%	16.19%	14.20%	150.24%	100.10%	1,059.06%
	DDH-87-2-292	1.74%	23.35%	16.10%	216.06%	100.30%	1,346.03%
	DDH-87-2-306	1.09%	19.62%	15.10%	271.80%	100.20%	1,803.60%
	DDH-87-2-324	0.56%	5.60%	12.00%	120.00%	100.20%	1,002.00%
@Total B	Total B	19.26%	231.68%	268.11%	3,105.40%	1,894.80%	22,721.68%
Total B/228.00	Avg B	0.08%	1.02%	1.18%	13.62%	8.31%	99.66%

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PLYMOUTH DDH-87-2
ASSAYS - UNIT SUBDIVISION

Formulas →		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnOCalc	Mn*"Length (ft)" MnCalc	Fe2O3
V	C								
	DDH-87-2-334	334.00	344.00	10.00	19.10%	14.79%	191.00%	147.95%	19.30%
	DDH-87-2-344	344.00	356.75	12.75	13.50%	10.46%	172.13%	133.33%	23.00%
	DDH-87-2-356	356.75	365.50	8.75	22.70%	17.58%	198.63%	153.85%	32.70%
@Total C	Total C	1034.75	1066.25	31.50	55.30%	42.84%	561.75%	435.13%	75.00%
Total C/31.50	Avg C	32.85	33.85	1.00	1.76%	1.36%	17.83%	13.81%	2.38%

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PLYMOUTH DDH-87-2
ASSAYS - UNIT SUBDIVISION

Formulas →		Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	Al2O3	Al2O3*"Length (ft)" AlCalc	CaO	CaO*"Length (ft)" CaCalc
	C							
	DDH-87-2-334	193.00%	29.40%	294.00%	7.68%	76.80%	3.19%	31.90%
	DDH-87-2-344	293.25%	33.70%	429.68%	9.77%	124.57%	1.94%	24.74%
	DDH-87-2-356	286.13%	17.30%	151.38%	5.52%	48.30%	3.26%	28.53%
@Total C	Total C	772.38%	80.40%	875.05%	22.97%	249.67%	8.39%	85.16%
Total C/31.50	Avg C	24.52%	2.55%	27.78%	0.73%	7.93%	0.27%	2.70%

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PLYMOUTH DDH-87-2
ASSAYS - UNIT SUBDIVISION

Formulas → / V	C	MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc	TiO2	TiO2*"Length (ft)" TiCalc
	DDH-87-2-334	3.91%	39.10%	0.18%	1.80%	0.28%	2.80%	0.32%	3.20%
	DDH-87-2-344	3.35%	42.71%	0.35%	4.46%	1.12%	14.28%	0.41%	5.23%
	DDH-87-2-356	1.67%	14.61%	0.31%	2.71%	0.42%	3.68%	0.25%	2.19%
@Total C	Total C	8.93%	96.43%	0.84%	8.98%	1.82%	20.76%	0.98%	10.62%
Total C/31.50	Avg C	0.28%	3.06%	0.03%	0.28%	0.06%	0.66%	0.03%	0.34%

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PLYMOUTH DDH-87-2
ASSAYS - UNIT SUBDIVISION

Formulas ——→ / V	C	P205	P205*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc	Sum	Sum*"Length (ft)" SumCalc
	DDH-87-2-334	1.38%	13.80%	15.50%	155.00%	100.30%	1,003.00%
	DDH-87-2-344	0.91%	11.60%	12.10%	154.28%	100.30%	1,278.83%
	DDH-87-2-356	1.41%	12.34%	14.50%	126.88%	100.20%	876.75%
@Total C	Total C	3.70%	37.74%	42.10%	436.15%	300.80%	3,158.58%
Total C/31.50	Avg C	0.12%	1.20%	1.34%	13.85%	9.55%	100.27%

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PLYMOUTH DDH-87-3
ASSAYS - UNIT SUBDIVISION

Formulas → / V		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnOCalc	Mn*"Length (ft)" MnCalc	Fe2O3
	Plymouth DDH-87-3								
	A								
	87-3-20	20.00	32.00	12.00	14.80%	11.46%	177.60%	137.57%	23.30%
	87-3-32	32.00	42.00	10.00	14.20%	11.00%	142.00%	109.99%	19.40%
	87-3-42	42.00	62.00	20.00	8.36%	6.48%	167.20%	129.51%	12.20%
	87-3-62	62.00	82.00	20.00	11.10%	8.60%	222.00%	171.96%	17.20%
	87-3-82	82.00	92.00	10.00	18.50%	14.33%	185.00%	143.30%	26.40%
	87-3-92	92.00	102.00	10.00	22.20%	17.20%	222.00%	171.96%	31.50%
	87-3-102	102.00	112.00	10.00	19.70%	15.26%	197.00%	152.59%	32.10%
	87-3-112	112.00	127.00	15.00	9.38%	7.27%	140.70%	108.99%	19.60%
	87-3-127	127.00	129.08	2.08	3.41%	2.64%	7.09%	5.49%	9.50%
	87-3-129	129.08	142.00	12.92	14.90%	11.54%	192.51%	149.12%	32.60%
	87-3-142	142.00	152.00	10.00	13.20%	10.22%	132.00%	102.25%	20.00%
@Total A	Total A	942.08	1074.08	132.00	149.75%	116.00%	1,785.10%	1,382.73%	243.80%
Total A /119.08	Avg A	7.91	9.02	1.11	1.26%	0.97%	14.99%	11.61%	2.05%
	B								
	87-3-152	152.00	169.92	17.92	17.80%	13.79%	318.96%	247.08%	24.70%
	87-3-169	169.92	174.17	4.25	26.00%	20.14%	110.50%	85.59%	33.30%
	87-3-174	174.17	182.00	7.83	15.90%	12.32%	124.50%	96.43%	33.60%
	87-3-182	182.00	192.00	10.00	21.00%	16.27%	210.00%	162.66%	33.30%
	87-3-192	192.00	212.00	20.00	20.00%	15.49%	400.00%	309.84%	30.50%
	87-3-212	212.00	232.00	20.00	19.10%	14.79%	382.00%	295.89%	33.10%
	87-3-232	232.00	242.00	10.00	19.60%	15.18%	196.00%	151.82%	33.00%
	87-3-242	242.00	262.00	20.00	14.00%	10.84%	280.00%	216.89%	23.10%
	87-3-262	262.00	282.00	20.00	16.50%	12.78%	330.00%	255.62%	19.50%
	87-3-282	282.00	292.00	10.00	7.73%	5.99%	77.30%	59.88%	17.60%
	87-3-292	292.00	312.00	20.00	15.10%	11.70%	302.00%	233.93%	19.90%
	87-3-312	312.00	336.33	24.33	11.50%	8.91%	279.80%	216.73%	21.40%
	87-3-336	336.33	346.58	10.25	14.30%	11.08%	146.58%	113.54%	23.00%
	87-3-346	346.58	362.00	15.42	15.40%	11.93%	237.47%	183.94%	21.00%
@Total B	Total B	3387.00	3597.00	210.00	233.93%	181.20%	3,395.11%	2,629.83%	367.00%
Total B/120	Avg B	28.23	29.98	1.75	1.95%	1.51%	28.29%	21.92%	3.06%

Maritime Resource Research Limited

PLYMOUTH DDH-87-3
ASSAYS - UNIT SUBDIVISION

Formulas →		Fe2O3*"Length (ft)" FeCalc	SiO2	Si02*"Length (ft)" SiCalc	Al2O3	Al2O3*"Length (ft)" AlCalc	CaO	CaO*"Length (ft)" CaCalc
	Plymouth DDH-87-3							
	A							
	87-3-20	279.60%	24.30%	291.60%	7.55%	90.60%	2.39%	28.68%
	87-3-32	194.00%	30.70%	307.00%	10.60%	106.00%	2.07%	20.70%
	87-3-42	244.00%	45.80%	916.00%	15.00%	300.00%	0.99%	19.80%
	87-3-62	344.00%	38.80%	776.00%	12.50%	250.00%	1.39%	27.80%
	87-3-82	264.00%	22.90%	229.00%	5.42%	54.20%	2.63%	26.30%
	87-3-92	315.00%	12.90%	129.00%	3.87%	38.70%	4.04%	40.40%
	87-3-102	321.00%	21.70%	217.00%	5.21%	52.10%	4.58%	45.80%
	87-3-112	294.00%	39.80%	597.00%	12.70%	190.50%	1.70%	25.50%
	87-3-127	19.76%	52.40%	108.99%	17.30%	35.98%	0.33%	0.69%
	87-3-129	421.19%	21.20%	273.90%	5.92%	76.49%	3.74%	48.32%
	87-3-142	200.00%	31.80%	318.00%	9.30%	93.00%	2.13%	21.30%
@Total A	Total A	2,896.55%	342.30%	4,163.50%	105.37%	1,287.57%	25.99%	305.29%
Total A /119.08	Avg A	24.32%	2.87%	34.96%	0.88%	10.81%	0.22%	2.56%
	B							
	87-3-152	442.62%	25.60%	458.75%	5.63%	100.89%	2.46%	44.08%
	87-3-169	141.53%	13.70%	58.23%	3.74%	15.90%	3.38%	14.37%
	87-3-174	263.09%	24.80%	194.18%	6.81%	53.32%	3.44%	26.94%
	87-3-182	333.00%	19.40%	194.00%	5.65%	56.50%	3.65%	36.50%
	87-3-192	610.00%	16.70%	334.00%	3.80%	76.00%	5.21%	104.20%
	87-3-212	662.00%	20.70%	414.00%	5.53%	110.60%	3.35%	67.00%
	87-3-232	330.00%	20.50%	205.00%	5.33%	53.30%	3.60%	36.00%
	87-3-242	462.00%	27.90%	558.00%	9.15%	183.00%	2.59%	51.80%
	87-3-262	390.00%	26.30%	526.00%	8.22%	164.40%	2.09%	41.80%
	87-3-282	175.00%	37.00%	370.00%	11.70%	117.00%	2.00%	20.00%
	87-3-292	398.00%	28.70%	574.00%	7.28%	145.60%	2.81%	56.20%
	87-3-312	520.66%	34.80%	846.68%	10.00%	243.30%	1.54%	37.47%
	87-3-336	235.75%	27.50%	281.88%	6.84%	70.11%	2.10%	21.53%
	87-3-346	323.82%	26.80%	413.26%	7.74%	119.35%	2.44%	37.62%
@Total B	Total B	5,288.47%	350.40%	5,427.98%	97.42%	1,509.27%	40.66%	595.50%
Total B/120	Avg B	44.07%	2.92%	45.23%	0.81%	12.58%	0.34%	4.96%

Maritime Resource Research Limited

PLYMOUTH DDH-87-3
ASSAYS - UNIT SUBDIVISION

Formulas → / V		MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc	TiO2	TiO2*"Length (ft)" TiCalc
	Plymouth DDH-87-3								
	A								
	87-3-20	2.69%	32.28%	0.24%	2.88%	2.15%	25.80%	0.34%	4.08%
	87-3-32	2.96%	29.60%	1.34%	13.40%	1.71%	17.10%	0.48%	4.80%
	87-3-42	2.68%	53.60%	3.22%	64.40%	1.92%	38.40%	0.61%	12.20%
	87-3-62	2.54%	50.80%	2.03%	40.60%	1.63%	32.60%	0.55%	11.00%
	87-3-82	1.64%	16.40%	0.41%	4.10%	0.65%	6.50%	0.22%	2.20%
	87-3-92	1.30%	13.00%	0.22%	2.20%	0.48%	4.80%	0.20%	2.00%
	87-3-102	1.15%	11.50%	0.44%	4.40%	0.52%	5.20%	0.23%	2.30%
	87-3-112	2.40%	36.00%	1.66%	24.90%	2.35%	35.25%	0.56%	8.40%
	87-3-127	2.85%	5.93%	3.11%	6.47%	3.57%	7.43%	0.74%	1.54%
	87-3-129	1.17%	15.12%	0.50%	6.46%	1.36%	17.57%	0.26%	3.36%
	87-3-142	1.92%	19.20%	0.35%	3.50%	2.67%	26.70%	0.41%	4.10%
@Total A	Total A	23.30%	283.42%	13.52%	173.31%	19.01%	217.35%	4.60%	55.98%
Total A /119.08	Avg A	0.20%	2.38%	0.11%	1.46%	0.16%	1.83%	0.04%	0.47%
	B								
	87-3-152	1.68%	30.11%	0.58%	10.39%	0.94%	16.84%	0.22%	3.94%
	87-3-169	1.37%	5.82%	0.18%	0.77%	0.17%	0.72%	0.18%	0.77%
	87-3-174	1.47%	11.51%	1.18%	9.24%	0.45%	3.52%	0.31%	2.43%
	87-3-182	1.17%	11.70%	0.42%	4.20%	0.68%	6.80%	0.26%	2.60%
	87-3-192	0.98%	19.60%	0.38%	7.60%	0.71%	14.20%	0.17%	3.40%
	87-3-212	1.40%	28.00%	0.22%	4.40%	0.78%	15.60%	0.26%	5.20%
	87-3-232	1.20%	12.00%	0.17%	1.70%	0.57%	5.70%	0.23%	2.30%
	87-3-242	2.00%	40.00%	0.52%	10.40%	2.02%	40.40%	0.40%	8.00%
	87-3-262	3.87%	77.40%	0.33%	6.60%	1.47%	29.40%	0.34%	6.80%
	87-3-282	4.61%	46.10%	0.29%	2.90%	2.15%	21.50%	0.48%	4.80%
	87-3-292	3.94%	78.80%	0.26%	5.20%	1.26%	25.20%	0.29%	5.80%
	87-3-312	3.77%	91.72%	0.58%	14.11%	1.07%	26.03%	0.43%	10.46%
	87-3-336	2.68%	27.47%	0.46%	4.72%	1.04%	10.66%	0.28%	2.87%
	87-3-346	3.50%	53.97%	0.40%	6.17%	1.18%	18.20%	0.34%	5.24%
@Total B	Total B	33.64%	534.20%	5.97%	88.39%	14.49%	234.78%	4.19%	64.61%
Total B/120	Avg B	0.28%	4.45%	0.05%	0.74%	0.12%	1.96%	0.03%	0.54%

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PLYMOUTH DDH-87-3
ASSAYS - UNIT SUBDIVISION

Formulas → / V		P205	P205*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc	Sum	Sum*"Length (ft)" SumCalc
	Plymouth DDH-87-3						
	A						
	87-3-20	1.18%	14.16%	21.20%	254.40%	100.20%	1,202.40%
	87-3-32	0.81%	8.10%	15.50%	155.00%	99.90%	999.00%
	87-3-42	0.29%	5.80%	7.70%	154.00%	98.90%	1,978.00%
	87-3-62	0.49%	9.80%	11.30%	226.00%	99.70%	1,994.00%
	87-3-82	1.10%	11.00%	20.20%	202.00%	100.10%	1,001.00%
	87-3-92	1.65%	16.50%	21.30%	213.00%	99.70%	997.00%
	87-3-102	1.61%	16.10%	12.50%	125.00%	100.00%	1,000.00%
	87-3-112	0.79%	11.85%	7.16%	107.40%	98.40%	1,476.00%
	87-3-127	0.09%	0.19%	5.31%	11.04%	100.00%	208.00%
	87-3-129	1.69%	21.83%	16.90%	218.35%	100.30%	1,295.88%
	87-3-142	0.85%	8.50%	17.30%	173.00%	100.10%	1,001.00%
@Total A	Total A	10.55%	123.83%	156.37%	1,839.19%	1,097.30%	13,152.28%
Total A /119.08	Avg A	0.09%	1.04%	1.31%	15.45%	9.21%	110.45%
	B						
	87-3-152	1.04%	18.64%	19.50%	349.44%	100.30%	1,797.38%
	87-3-169	1.42%	6.04%	16.50%	70.13%	100.00%	425.00%
	87-3-174	1.70%	13.31%	10.20%	79.87%	100.00%	783.00%
	87-3-182	1.54%	15.40%	12.80%	128.00%	100.10%	1,001.00%
	87-3-192	1.63%	32.60%	19.80%	396.00%	100.00%	2,000.00%
	87-3-212	1.56%	31.20%	14.10%	282.00%	100.20%	2,004.00%
	87-3-232	1.61%	16.10%	14.40%	144.00%	100.30%	1,003.00%
	87-3-242	1.07%	21.40%	17.00%	340.00%	99.90%	1,998.00%
	87-3-262	0.82%	16.40%	20.50%	410.00%	100.00%	2,000.00%
	87-3-282	0.87%	8.70%	15.30%	153.00%	99.80%	998.00%
	87-3-292	0.92%	18.40%	19.50%	390.00%	100.00%	2,000.00%
	87-3-312	0.67%	16.30%	14.40%	350.35%	100.20%	2,437.87%
	87-3-336	0.94%	9.64%	21.00%	215.25%	100.20%	1,027.05%
	87-3-346	1.01%	15.57%	20.30%	313.03%	100.20%	1,545.08%
@Total B	Total B	16.80%	239.69%	235.30%	3,621.06%	1,401.20%	21,019.38%
Total B/120	Avg B	0.14%	2.00%	1.96%	30.18%	11.68%	175.16%

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PLYMOUTH DDH-87-3
ASSAYS - UNIT SUBDIVISION

Formulas → / V		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnCalc	Mn*"Length (ft)" MnCalc	Fe2O3
	C								
	87-3-362	362.00	382.00	20.00	1.90%	1.47%	38.00%	29.43%	13.50%
	87-3-382	382.00	392.00	10.00	1.23%	0.95%	12.30%	9.53%	10.60%
	87-3-392	392.00	412.00	20.00	1.13%	0.89%	22.60%	17.51%	10.70%
	87-3-412	412.00	422.50	10.50	0.69%	0.53%	7.25%	5.61%	12.50%
@Total C	Total C	1548.00	1608.50	60.50	4.95%	3.83%	80.15%	62.08%	47.30%
Total C/60.5	Ave C	25.59	26.59	1.00	0.08%	0.06%	1.32%	1.03%	0.78%
	D								
	87-3-422	422.50	432.00	9.50	2.30%	1.78%	21.85%	16.92%	10.70%
	87-3-432	432.00	462.00	30.00	4.48%	3.47%	134.40%	104.11%	10.10%
	87-3-462	462.00	492.00	30.00	0.49%	0.38%	14.70%	11.39%	9.68%
	87-3-492	492.00	522.00	30.00	1.74%	1.35%	52.20%	40.43%	10.60%
	87-3-532	522.00	552.00	30.00	0.38%	0.29%	11.40%	8.83%	10.10%
	87-3-562	552.00	582.00	30.00	1.19%	0.92%	35.70%	27.65%	10.50%
	87-3-592	582.00	602.00	20.00	0.47%	0.36%	9.40%	7.28%	10.20%
	87-3-622	602.00	635.00	33.00	0.34%	0.26%	11.22%	8.69%	6.25%
@Total D	Total D	4066.50	4279.00	212.50	11.39%	8.82%	290.87%	225.31%	78.13%
Total D/212.5	Ave D	19.14	20.14	1.00	0.05%	0.04%	1.37%	1.06%	0.37%

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PLYMOUTH DDH-87-3
ASSAYS - UNIT SUBDIVISION

Formulas → / V		Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	Al2O3	Al2O3*"Length (ft)" AlCalc	CaO	CaO*"Length (ft)" CaCalc
	C							
	87-3-362	270.00%	50.70%	1,014.00%	17.50%	350.00%	0.44%	8.80%
	87-3-382	106.00%	53.90%	539.00%	18.20%	182.00%	0.37%	3.70%
	87-3-392	214.00%	53.10%	1,062.00%	18.60%	372.00%	0.35%	7.00%
	87-3-412	131.25%	53.10%	557.55%	19.20%	201.60%	0.31%	3.26%
@Total C	Total C	721.25%	210.80%	3,172.55%	73.50%	1,105.60%	1.47%	22.76%
Total C/60.5	Ave C	11.92%	3.48%	52.44%	1.21%	18.27%	0.02%	0.38%
	D							
	87-3-422	101.65%	52.50%	498.75%	17.60%	167.20%	0.50%	4.75%
	87-3-432	303.00%	48.40%	1,452.00%	17.50%	525.00%	1.13%	33.90%
	87-3-462	290.40%	54.20%	1,626.00%	19.80%	594.00%	0.35%	10.50%
	87-3-492	318.00%	52.70%	1,581.00%	18.80%	564.00%	0.41%	12.30%
	87-3-532	303.00%	54.80%	1,644.00%	19.70%	591.00%	0.26%	7.80%
	87-3-562	315.00%	53.60%	1,608.00%	19.00%	570.00%	0.45%	13.50%
	87-3-592	204.00%	51.90%	1,038.00%	19.10%	382.00%	1.51%	30.20%
	87-3-622	206.25%	45.20%	1,491.60%	14.20%	468.60%	12.20%	402.60%
@Total D	Total D	2,041.30%	413.30%	10,939.35%	145.70%	3,861.80%	16.81%	515.55%
Total D/212.5	Ave D	9.61%	1.94%	51.48%	0.69%	18.17%	0.08%	2.43%

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PLYMOUTH DDH-87-3
ASSAYS - UNIT SUBDIVISION

Formulas → / V		MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc	TiO2	TiO2*"Length (ft)" TiCalc
	C								
	87-3-362	3.05%	61.00%	1.12%	22.40%	3.75%	75.00%	0.69%	13.80%
	87-3-382	2.71%	27.10%	1.21%	12.10%	4.55%	45.50%	0.71%	7.10%
	87-3-392	2.52%	50.40%	1.01%	20.20%	4.90%	98.00%	0.70%	14.00%
	87-3-412	2.47%	25.94%	1.00%	10.50%	4.90%	51.45%	0.73%	7.67%
@Total C	Total C	10.75%	164.44%	4.34%	65.20%	18.10%	269.95%	2.83%	42.57%
Total C/60.5	Ave C	0.18%	2.72%	0.07%	1.08%	0.30%	4.46%	0.05%	0.70%
	D								
	87-3-422	2.92%	27.74%	0.85%	8.08%	4.68%	44.46%	0.67%	6.37%
	87-3-432	2.95%	88.50%	0.78%	23.40%	4.82%	144.60%	0.69%	20.70%
	87-3-462	2.82%	84.60%	1.13%	33.90%	5.32%	159.60%	0.76%	22.80%
	87-3-492	2.80%	84.00%	0.94%	28.20%	5.03%	150.90%	0.74%	22.20%
	87-3-532	2.73%	81.90%	0.98%	29.40%	5.28%	158.40%	0.76%	22.80%
	87-3-562	2.85%	85.50%	1.03%	30.90%	4.88%	146.40%	0.75%	22.50%
	87-3-592	3.13%	62.60%	0.98%	19.60%	4.99%	99.80%	0.75%	15.00%
	87-3-622	2.86%	94.38%	1.28%	42.24%	3.43%	113.19%	0.66%	21.78%
@Total D	Total D	23.06%	609.22%	7.97%	215.72%	38.43%	1,017.35%	5.78%	154.15%
Total D/212.5	Ave D	0.11%	2.87%	0.04%	1.02%	0.18%	4.79%	0.03%	0.73%

PLYMOUTH DDH-87-3
ASSAYS - UNIT SUBDIVISION

Formulas → / V		P205	P205*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc	Sum	Sum*"Length (ft)" SumCalc
	C						
	87-3-362	0.18%	3.60%	6.47%	129.40%	99.50%	1,990.00%
	87-3-382	0.10%	1.00%	5.08%	50.80%	98.80%	988.00%
	87-3-392	0.11%	2.20%	5.39%	107.80%	98.70%	1,974.00%
	87-3-412	0.11%	1.16%	4.31%	45.26%	99.50%	1,044.75%
@Total C	Total C	0.50%	7.96%	21.25%	333.26%	396.50%	5,996.75%
Total C/60.5	Ave C	0.01%	0.13%	0.35%	5.51%	6.55%	99.12%
	D						
	87-3-422	0.11%	1.05%	6.00%	57.00%	99.00%	940.50%
	87-3-432	0.34%	10.20%	7.47%	224.10%	98.80%	2,964.00%
	87-3-462	0.11%	3.30%	4.31%	129.30%	99.10%	2,973.00%
	87-3-492	0.12%	3.60%	5.16%	154.80%	99.20%	2,976.00%
	87-3-532	0.09%	2.70%	4.16%	124.80%	99.40%	2,982.00%
	87-3-562	0.13%	3.90%	4.85%	145.50%	99.40%	2,982.00%
	87-3-592	0.13%	2.60%	5.47%	109.40%	98.80%	1,976.00%
	87-3-622	0.11%	3.63%	13.10%	432.30%	99.80%	3,293.40%
@Total D	Total D	1.14%	30.98%	50.52%	1,377.20%	793.50%	21,086.90%
Total D/212.5	Ave D	0.01%	0.15%	0.24%	6.48%	3.73%	99.23%

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PLYMOUTH DDH-87-4
ASSAYS - UNIT SUBDIVISION

Formulas → / V		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnOCalc	Mn*"Length (ft)" MnCalc
	Plymouth DDH-87-4							
	A							
	87-4-10	10.00	13.58	3.58	20.70%	16.03%	74.11%	57.40%
	87-4-13	13.58	17.83	4.25	4.10%	3.18%	17.43%	13.50%
	87-4-17	17.83	21.92	4.09	9.17%	7.10%	37.51%	29.05%
	87-4-21	21.92	33.83	11.91	5.60%	4.34%	66.70%	51.66%
	87-4-33	33.83	43.83	10.00	9.85%	7.63%	98.50%	76.30%
	87-4-43	43.83	50.00	6.17	13.40%	10.38%	82.68%	64.04%
	87-4-50	50.00	70.00	20.00	14.40%	11.15%	288.00%	223.08%
	87-4-70	70.00	90.00	20.00	15.70%	12.16%	314.00%	243.22%
	87-4-90	90.00	110.00	20.00	10.50%	8.13%	210.00%	162.66%
	87-4-110	110.00	112.00	2.00	27.90%	21.61%	55.80%	43.22%
	87-4-112	112.00	130.00	18.00	19.90%	15.41%	358.20%	277.46%
	87-4-130	130.00	150.00	20.00	20.30%	15.72%	406.00%	314.48%
	87-4-150	150.00	170.00	20.00	16.30%	12.63%	326.00%	252.52%
	87-4-170	170.00	182.00	12.00	11.70%	9.06%	140.40%	108.75%
	87-4-182	182.00	195.83	13.83	14.20%	11.00%	196.39%	152.12%
	87-4-195	195.83	206.00	10.17	11.60%	8.99%	117.97%	91.38%
	87-4-206	206.00	220.00	14.00	22.10%	17.12%	309.40%	239.66%
	87-4-220	220.00	231.83	11.83	17.60%	13.63%	208.21%	161.28%
	87-4-231	231.83	246.00	14.17	13.70%	10.61%	194.13%	150.37%
	87-4-246	246.00	261.30	15.30	19.10%	14.79%	292.23%	226.36%
	87-4-261	261.30	268.42	7.12	10.10%	7.82%	71.91%	55.70%
	87-4-268	268.42	280.00	11.58	17.80%	13.79%	206.12%	159.66%
@Total A	Total A	2834.37	3104.37	270.00	325.72%	252.30%	4,071.67%	3,153.89%
Total A/270	Average A	10.50	11.50	1.00	1.21%	0.93%	15.08%	11.68%
	B							
	87-4-280	280.00	300.00	20.00	2.89%	2.24%	57.80%	44.77%
	87-4-300	300.00	320.00	20.00	5.99%	4.64%	119.80%	92.80%
	87-4-320	320.00	330.00	10.00	1.52%	1.18%	15.20%	11.77%
	87-4-330	330.00	350.00	20.00	3.20%	2.48%	64.00%	49.57%
	87-4-350	350.00	360.00	10.00	2.92%	2.26%	29.20%	22.62%
	87-4-360	360.00	370.00	10.00	5.19%	4.02%	51.90%	40.20%

Maritime Resource Research Limited

PLYMOUTH DDH-87-4
ASSAYS - UNIT SUBDIVISION

Formulas → / V		Fe2O3	Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	AL2O3	AL2O3*"Length (ft)" ALCalc	CaO
	Plymouth DDH-87-4							
	A							
	87-4-10	47.20%	168.98%	7.08%	25.35%	2.42%	8.66%	0.33%
	87-4-13	8.63%	36.68%	52.10%	221.43%	17.20%	73.10%	4.03%
	87-4-17	18.00%	73.62%	38.80%	158.69%	12.40%	50.72%	1.32%
	87-4-21	10.30%	122.67%	47.00%	559.77%	17.50%	208.43%	0.40%
	87-4-33	16.60%	166.00%	42.20%	422.00%	12.80%	128.00%	1.06%
	87-4-43	22.40%	138.21%	30.60%	188.80%	9.50%	58.62%	1.91%
	87-4-50	23.10%	462.00%	30.60%	612.00%	9.82%	196.40%	2.26%
	87-4-70	27.10%	542.00%	22.90%	458.00%	6.26%	125.20%	3.09%
	87-4-90	19.70%	394.00%	37.30%	746.00%	12.10%	242.00%	1.41%
	87-4-110	25.90%	51.80%	9.94%	19.88%	2.72%	5.44%	3.80%
	87-4-112	32.10%	577.80%	19.30%	347.40%	5.06%	91.08%	3.57%
	87-4-130	30.70%	614.00%	17.80%	356.00%	5.63%	112.60%	4.31%
	87-4-150	31.00%	620.00%	25.90%	518.00%	6.31%	126.20%	3.45%
	87-4-170	16.80%	201.60%	39.00%	468.00%	13.50%	162.00%	1.29%
	87-4-182	32.30%	446.71%	28.60%	395.54%	7.19%	99.44%	3.37%
	87-4-195	21.40%	217.64%	34.80%	353.92%	12.80%	130.18%	1.78%
	87-4-206	30.00%	420.00%	20.80%	291.20%	4.85%	67.90%	3.53%
	87-4-220	34.40%	406.95%	21.40%	253.16%	5.95%	70.39%	3.69%
	87-4-231	25.30%	358.50%	33.00%	467.61%	10.20%	144.53%	2.19%
	87-4-246	20.50%	313.65%	30.10%	460.53%	9.42%	144.13%	2.31%
	87-4-261	30.10%	214.31%	32.60%	232.11%	10.50%	74.76%	1.97%
	87-4-268	31.60%	365.93%	24.70%	286.03%	6.85%	79.32%	2.86%
@Total A	Total A	555.13%	6,913.04%	646.52%	7,841.41%	200.98%	2,399.08%	53.93%
Total A/270	Average A	2.06%	25.60%	2.39%	29.04%	0.74%	8.89%	0.20%
	B							
	87-4-280	12.00%	240.00%	51.20%	1,024.00%	17.90%	358.00%	0.32%
	87-4-300	12.00%	240.00%	48.90%	978.00%	16.10%	322.00%	0.85%
	87-4-320	9.94%	99.40%	54.90%	549.00%	19.40%	194.00%	0.21%
	87-4-330	11.70%	234.00%	52.50%	1,050.00%	17.90%	358.00%	0.38%
	87-4-350	11.60%	116.00%	52.30%	523.00%	17.50%	175.00%	0.37%
	87-4-360	14.70%	147.00%	47.20%	472.00%	15.40%	154.00%	0.74%

Maritime Resource Research Limited

PLYMOUTH DDH-87-4
ASSAYS - UNIT SUBDIVISION

Formulas → / V		CaO*"Length (ft)" CaCalc	CaO	MgO*"Length (ft)" MgCalc	MgO	Na2O*"Length (ft)" NaCalc	Na2O	K2O*"Length (ft)" KCalc
	Plymouth DDH-87-4							
	A							
	87-4-10	1.18%	0.80%	2.86%	0.47%	1.68%	0.32%	1.15%
	87-4-13	17.13%	3.36%	14.28%	3.81%	16.19%	2.87%	12.20%
	87-4-17	5.40%	2.75%	11.25%	2.02%	8.26%	3.25%	13.29%
	87-4-21	4.76%	3.38%	40.26%	4.15%	49.43%	2.78%	33.11%
	87-4-33	10.60%	2.64%	26.40%	1.77%	17.70%	3.38%	33.80%
	87-4-43	11.78%	2.29%	14.13%	1.16%	7.16%	1.76%	10.86%
	87-4-50	45.20%	2.11%	42.20%	1.12%	22.40%	1.54%	30.80%
	87-4-70	61.80%	1.79%	35.80%	0.56%	11.20%	1.41%	28.20%
	87-4-90	28.20%	3.18%	63.60%	1.28%	25.60%	1.77%	35.40%
	87-4-110	7.60%	1.58%	3.16%	0.39%	0.78%	0.60%	1.20%
	87-4-112	64.26%	1.41%	25.38%	0.47%	8.46%	0.47%	8.46%
	87-4-130	86.20%	1.44%	28.80%	0.33%	6.60%	0.33%	6.60%
	87-4-150	69.00%	1.36%	27.20%	0.63%	12.60%	0.68%	13.60%
	87-4-170	15.48%	2.62%	31.44%	1.45%	17.40%	2.77%	33.24%
	87-4-182	46.61%	1.64%	22.68%	1.00%	13.83%	1.31%	18.12%
	87-4-195	18.10%	2.58%	26.24%	1.22%	12.41%	2.79%	28.37%
	87-4-206	49.42%	1.42%	19.88%	0.46%	6.44%	0.47%	6.58%
	87-4-220	43.65%	1.41%	16.68%	0.39%	4.61%	0.60%	7.10%
	87-4-231	31.03%	1.96%	27.77%	1.25%	17.71%	2.00%	28.34%
	87-4-246	35.34%	1.94%	29.68%	1.08%	16.52%	2.27%	34.73%
	87-4-261	14.03%	2.33%	16.59%	0.85%	6.05%	1.75%	12.46%
	87-4-268	33.12%	1.69%	19.57%	0.48%	5.56%	0.81%	9.38%
@Total A	Total A	699.90%	45.68%	545.85%	26.34%	288.60%	35.93%	406.99%
Total A/270	Average A	2.59%	0.17%	2.02%	0.10%	1.07%	0.13%	1.51%
	B							
	87-4-280	6.40%	3.00%	60.00%	2.17%	43.40%	3.75%	75.00%
	87-4-300	17.00%	2.94%	58.80%	1.35%	27.00%	3.55%	71.00%
	87-4-320	2.10%	2.59%	25.90%	1.28%	12.80%	5.07%	50.70%	
	87-4-330	7.60%	2.78%	55.60%	1.31%	26.20%	4.19%	83.80%
	87-4-350	3.70%	2.79%	27.90%	1.67%	16.70%	3.97%	39.70%
	87-4-360	7.40%	3.34%	33.40%	1.89%	18.90%	2.58%	25.80%

Maritime Resource Research Limited

PLYMOUTH DDH-87-4
ASSAYS UNIT SUBDIVISION

Formulas → / V		TiO2	TiO2*"Length (ft)" TiCalc	P2O5	P2O5*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc
	Plymouth DDH-87-4						
	A						
	87-4-10	0.10%	0.36%	1.82%	6.52%	15.20%	54.42%
	87-4-13	0.73%	3.10%	0.07%	0.30%	5.23%	22.23%
	87-4-17	0.53%	2.17%	0.64%	2.62%	10.80%	44.17%
	87-4-21	0.76%	9.05%	0.15%	1.79%	6.47%	77.06%
	87-4-33	0.57%	5.70%	0.51%	5.10%	8.47%	84.70%
	87-4-43	0.42%	2.59%	0.84%	5.18%	15.60%	96.25%
	87-4-50	0.44%	8.80%	1.04%	20.80%	13.80%	276.00%
	87-4-70	0.27%	5.40%	1.41%	28.20%	19.80%	396.00%
	87-4-90	0.50%	10.00%	0.61%	12.20%	11.80%	236.00%
	87-4-110	0.14%	0.28%	1.24%	2.48%	25.60%	51.20%
	87-4-112	0.23%	4.14%	1.61%	28.98%	16.20%	291.60%
	87-4-130	0.25%	5.00%	1.64%	32.80%	17.20%	344.00%
	87-4-150	0.25%	5.00%	1.79%	35.80%	12.00%	240.00%
	87-4-170	0.60%	7.20%	0.52%	6.24%	9.23%	110.76%
	87-4-182	0.31%	4.29%	1.52%	21.02%	8.70%	120.32%
	87-4-195	0.55%	5.59%	0.76%	7.73%	8.77%	89.19%
	87-4-206	0.22%	3.08%	1.52%	21.28%	14.20%	198.80%
	87-4-220	0.27%	3.19%	1.81%	21.41%	12.50%	147.88%
	87-4-231	0.45%	6.38%	1.07%	15.16%	8.70%	123.28%
	87-4-246	0.43%	6.58%	0.81%	12.39%	10.70%	163.71%
	87-4-261	0.47%	3.35%	1.24%	8.83%	8.00%	56.96%
	87-4-268	0.33%	3.82%	1.46%	16.91%	11.50%	133.17%
@Total A	Total A	8.82%	105.07%	24.08%	313.73%	270.47%	3,357.69%
Total A/270	Average A	0.03%	0.39%	0.09%	1.16%	1.00%	12.44%
	B						
	87-4-280	0.74%	14.80%	0.17%	3.40%	4.85%	97.00%
	87-4-300	0.63%	12.60%	0.35%	7.00%	6.93%	138.60%
	87-4-320	0.73%	7.30%	0.11%	1.10%	4.31%	43.10%
	87-4-330	0.71%	14.20%	0.20%	4.00%	5.16%	103.20%
	87-4-350	0.70%	7.00%	0.21%	2.10%	5.16%	51.60%
	87-4-360	0.65%	6.50%	0.37%	3.70%	6.85%	68.50%

PLYMOUTH DDH-87-4
ASSAYS - UNIT SUBDIVISION

Formulas →		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnCalc	Mn*"Length (ft)" MnCalc
@Total B	Total B	1940.00	2030.00	90.00	21.71%	16.82%	337.90%	261.74%
Total B/90	Average B	21.56	22.56	1.00	0.24%	0.19%	3.75%	2.91%
	C							
	87-4-370	370.00	390.00	20.00	15.00%	11.62%	300.00%	232.38%
	87-4-390	390.00	410.00	20.00	15.40%	11.93%	308.00%	238.57%
	87-4-410	410.00	420.00	10.00	18.70%	14.48%	187.00%	144.85%
	87-4-420	420.00	440.00	20.00	15.90%	12.32%	318.00%	246.32%
	87-4-440	440.00	451.30	11.30	12.60%	9.76%	142.38%	110.29%
	87-4-451	451.30	460.00	8.70	14.50%	11.23%	126.15%	97.71%
	87-4-460	460.00	470.00	10.00	16.60%	12.86%	166.00%	128.58%
	87-4-470	470.00	480.00	10.00	12.40%	9.60%	124.00%	96.05%
	87-4-480	480.00	503.42	23.42	9.47%	7.34%	221.79%	171.80%
	87-4-503	503.42	520.00	16.58	15.30%	11.85%	253.67%	196.49%
	87-4-520	520.00	539.75	19.75	13.70%	10.61%	270.58%	209.59%
	87-4-539	539.75	550.92	11.17	7.40%	5.73%	82.66%	64.03%
	87-4-550	550.92	561.00	10.08	21.40%	16.58%	215.71%	167.09%
	87-4-561	561.00	571.00	10.00	17.50%	13.56%	175.00%	135.55%
	87-4-571	571.00	580.00	9.00	14.30%	11.08%	128.70%	99.69%
	87-4-580	580.00	600.00	20.00	13.90%	10.77%	278.00%	215.34%
	87-4-600	600.00	606.30	6.30	11.60%	8.99%	73.08%	56.61%
	87-4-611	611.00	615.75	4.75	13.90%	10.77%	66.03%	51.14%
@Total C	Total C	8928.39	9169.44	241.05	259.57%	201.06%	3,436.74%	2,662.08%
Total C/241.05	Average C	37.04	38.04	1.00	1.08%	0.83%	14.26%	11.04%
@Total "Plymouth DDH-87-4"-Average A-Average B-Average C	Total	13702.76	14303.81	601.05	6.07	4.70	78.46	60.78
Total/601.5	Average Value	22.78	23.78	1.00	1.01%	0.78%	13.04%	10.10%

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PLYMOUTH DDH-87-4
ASSAYS - UNIT SUBDIVISION

Formulas → / V		Fe2O3	Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	AL2O3	AL2O3*"Length (ft)" ALCalc	CaO
@Total B	Total B	71.94%	1,076.40%	307.00%	4,596.00%	104.20%	1,561.00%	2.87%
Total B/90	Average B	0.80%	11.96%	3.41%	51.07%	1.16%	17.34%	0.03%
	C							
	87-4-370	22.20%	444.00%	30.20%	604.00%	9.30%	186.00%	2.37%
	87-4-390	23.50%	470.00%	29.50%	590.00%	9.01%	180.20%	2.50%
	87-4-410	27.40%	274.00%	19.00%	190.00%	6.36%	63.60%	3.88%
	87-4-420	28.10%	562.00%	26.70%	534.00%	8.11%	162.20%	3.41%
	87-4-440	18.00%	203.40%	38.30%	432.79%	12.30%	138.99%	1.34%
	87-4-451	19.90%	173.13%	35.00%	304.50%	11.40%	99.18%	2.73%
	87-4-460	23.30%	233.00%	30.00%	300.00%	8.30%	83.00%	3.91%
	87-4-470	19.50%	195.00%	37.60%	376.00%	11.50%	115.00%	1.97%
	87-4-480	16.10%	377.06%	43.30%	1,014.09%	14.40%	337.25%	0.91%
	87-4-503	20.90%	346.52%	34.90%	578.64%	10.10%	167.46%	2.93%
	87-4-520	22.60%	446.35%	35.90%	709.03%	10.90%	215.28%	1.74%
	87-4-539	16.60%	185.42%	43.40%	484.78%	15.00%	167.55%	0.95%
	87-4-550	29.30%	295.34%	22.80%	229.82%	5.45%	54.94%	2.83%
	87-4-561	35.90%	359.00%	22.00%	220.00%	6.19%	61.90%	2.82%
	87-4-571	22.30%	200.70%	35.10%	315.90%	10.40%	93.60%	1.49%
	87-4-580	26.10%	522.00%	31.00%	620.00%	10.30%	206.00%	2.47%
	87-4-600	24.80%	156.24%	36.30%	228.69%	10.50%	66.15%	1.72%
	87-4-611	16.60%	78.85%	37.70%	179.08%	12.30%	58.43%	1.40%
@Total C	Total C	413.10%	5,522.02%	588.70%	7,911.31%	181.82%	2,456.71%	41.37%
Total C/241.05	Average C	1.71%	22.91%	2.44%	32.82%	0.75%	10.19%	0.17%
@Total "Plymouth DDH-87-4"- Average A-Average B-Average C	Total	10.40	135.11	15.42	203.49	4.87	64.17	0.98
Total/601.5	Average Value	1.73%	22.46%	2.56%	33.83%	0.81%	10.67%	0.16%

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PLYMOUTH DDH-87-4
ASSAYS - UNIT SUBDIVISION

Formulas → / V		CaO*"Length (ft)" CaCalc	MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc
@Total B	Total B	44.20%	17.44%	261.60%	9.67%	145.00%	23.11%	346.00%
Total B/90	Average B	0.49%	0.19%	2.91%	0.11%	1.61%	0.26%	3.84%
	C							
	87-4-370	47.40%	4.13%	82.60%	0.74%	14.80%	0.72%	14.40%
	87-4-390	50.00%	3.68%	73.60%	1.20%	24.00%	0.61%	12.20%
	87-4-410	38.80%	1.73%	17.30%	0.79%	7.90%	0.76%	7.60%
	87-4-420	68.20%	1.89%	37.80%	1.17%	23.40%	1.57%	31.40%
	87-4-440	15.14%	2.34%	26.44%	2.42%	27.35%	2.34%	26.44%
	87-4-451	23.75%	2.36%	20.53%	2.15%	18.71%	2.14%	18.62%
	87-4-460	39.10%	1.74%	17.40%	1.60%	16.00%	2.40%	24.00%
	87-4-470	19.70%	2.25%	22.50%	2.14%	21.40%	3.15%	31.50%
	87-4-480	21.31%	2.60%	60.89%	3.01%	70.49%	2.79%	65.34%
	87-4-503	48.58%	2.01%	33.33%	2.29%	37.97%	2.01%	33.33%
	87-4-520	34.37%	2.20%	43.45%	2.36%	46.61%	2.35%	46.41%
	87-4-539	10.61%	4.02%	44.90%	1.41%	15.75%	2.94%	32.84%
	87-4-550	28.53%	1.77%	17.84%	1.06%	10.68%	1.02%	10.28%
	87-4-561	28.20%	1.67%	16.70%	0.90%	9.00%	1.39%	13.90%
	87-4-571	13.41%	2.54%	22.86%	1.65%	14.85%	1.96%	17.64%
	87-4-580	49.40%	3.39%	67.80%	1.09%	21.80%	1.01%	20.20%
	87-4-600	10.84%	1.98%	12.47%	1.99%	12.54%	2.06%	12.98%
	87-4-611	6.65%	2.25%	10.69%	2.27%	10.78%	2.63%	12.49%
@Total C	Total C	553.98%	44.55%	629.11%	30.24%	404.03%	33.85%	431.57%
Total C/241.05	Average C	2.30%	0.18%	2.61%	0.13%	1.68%	0.14%	1.79%
@Total "Plymouth DDH-87-4"-Average A-Average B-Average C	Total	12.98	1.08	14.37	0.66	8.38	0.93	11.85
Total/601.5	Average Value	2.16%	0.18%	2.39%	0.11%	1.39%	0.15%	1.97%

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PLYMOUTH DDH-87-4
ASSAYS UNIT SUBDIVISION

Formulas → / V		TiO2	TiO2*"Length (ft)" TiCalc	P2O5	P2O5*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc
@Total B	Total B	4.16%	62.40%	1.41%	21.30%	33.26%	502.00%
Total B/90	Average B	0.05%	0.69%	0.02%	0.24%	0.37%	5.58%
	C						
	87-4-370	0.40%	8.00%	0.91%	18.20%	14.40%	288.00%
	87-4-390	0.39%	7.80%	0.97%	19.40%	13.50%	270.00%
	87-4-410	0.29%	2.90%	1.36%	13.60%	19.90%	199.00%
	87-4-420	0.36%	7.20%	1.28%	25.60%	11.20%	224.00%
	87-4-440	0.54%	6.10%	0.64%	7.23%	8.54%	96.50%
	87-4-451	0.52%	4.52%	0.77%	6.70%	7.31%	63.60%
	87-4-460	0.42%	4.20%	1.21%	12.10%	9.93%	99.30%
	87-4-470	0.57%	5.70%	0.90%	9.00%	7.00%	70.00%
	87-4-480	0.62%	14.52%	0.49%	11.48%	5.23%	122.49%
	87-4-503	0.52%	8.62%	0.96%	15.92%	6.08%	100.81%
	87-4-520	0.48%	9.48%	0.79%	15.60%	5.85%	115.54%
	87-4-539	0.61%	6.81%	0.56%	6.26%	6.62%	73.95%
	87-4-550	0.23%	2.32%	1.44%	14.52%	12.20%	122.98%
	87-4-561	0.28%	2.80%	1.62%	16.20%	9.70%	97.00%
	87-4-571	0.44%	3.96%	0.75%	6.75%	9.31%	83.79%
	87-4-580	0.42%	8.40%	1.13%	22.60%	9.08%	181.60%
	87-4-600	0.45%	2.84%	1.00%	6.30%	7.31%	46.05%
	87-4-611	0.53%	2.52%	0.64%	3.04%	9.16%	43.51%
@Total C	Total C	8.07%	108.69%	17.42%	230.49%	172.32%	2,298.10%
Total C/241.05	Average C	0.03%	0.45%	0.07%	0.96%	0.71%	9.53%
@Total "Plymouth DDH-87-4"-Average A-Average B-Average C	Total	0.21	2.76	0.43	5.66	4.76	61.58
Total/601.5	Average Value	0.03%	0.46%	0.07%	0.94%	0.79%	10.24%

Maritime Resource Research Limited

PLYMOUTH DDH-87-5
ASSAYS - UNIT SUBDIVISION

Formulas →		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnOCalc	Mn*"Length (ft)" MnCalc
	Plymouth DDH-87-5							
	A							
	87-5-10	10.00	20.00	10.00	17.00%	13.17%	170.00%	131.68%
	87-5-20	20.00	30.00	10.00	16.80%	13.01%	168.00%	130.13%
	87-5-30	30.00	40.00	10.00	12.70%	9.84%	127.00%	98.37%
	87-5-40	40.00	50.00	10.00	13.20%	10.22%	132.00%	102.25%
	87-5-50	50.00	60.00	10.00	14.30%	11.08%	143.00%	110.77%
	87-5-60	60.00	70.25	10.25	12.40%	9.60%	127.10%	98.45%
	87-5-70	70.25	80.00	9.75	18.20%	14.10%	177.45%	137.45%
	87-5-80	80.00	87.92	7.92	19.80%	15.34%	156.82%	121.47%
	87-5-87	87.92	95.00	7.08	15.20%	11.77%	107.62%	83.36%
	87-5-95	95.00	100.17	5.17	11.60%	8.99%	59.97%	46.45%
	87-5-100	100.17	108.00	7.83	22.30%	17.27%	174.61%	135.25%
	87-5-108	108.00	118.00	10.00	16.40%	12.70%	164.00%	127.03%
	87-5-118	118.00	128.00	10.00	16.20%	12.55%	162.00%	125.48%
	87-5-128	128.00	138.00	10.00	17.90%	13.87%	179.00%	138.65%
	87-5-138	138.00	151.17	13.17	13.70%	10.61%	180.43%	139.76%
	87-5-151	151.17	160.00	8.83	13.80%	10.69%	121.85%	94.39%
	87-5-160*	160.00	170.00	10.00	12.90%	9.99%	129.00%	99.92%
	87-5-170	170.00	172.00	2.00	15.30%	11.85%	30.60%	23.70%
	87-5-160*	172.00	180.00	8.00	12.90%	9.99%	103.20%	79.94%
	87-5-180	180.00	200.00	20.00	13.00%	10.07%	260.00%	201.39%
@Total A	Total A	1968.51	2158.51	190.00	305.60%	236.72%	2,873.65%	2,225.91%
Total A/190	Average A	10.36	11.36	1.00	1.61%	1.25%	15.12%	11.72%
	*Includes 160-170 and 172-180							
	B							
	87-5-200	200.00	220.00	20.00	20.00%	15.49%	400.00%	309.84%
	87-5-220	220.00	240.00	20.00	17.10%	13.25%	342.00%	264.91%
	87-5-240	240.00	245.00	5.00	17.40%	13.48%	87.00%	67.39%
	87-5-245	245.00	255.00	10.00	19.20%	14.87%	192.00%	148.72%
	87-5-255	255.00	275.00	20.00	19.40%	15.03%	388.00%	300.54%
	87-5-275	275.00	295.00	20.00	23.00%	17.82%	460.00%	356.31%

Maritime Resource Research Limited

PLYMOUTH DDH-87-5
ASSAYS - UNIT SUBDIVISION

Formulas → / V		Fe2O3	Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	AL2O3	AL2O3*"Length (ft)" AlCalc	CaO
	Plymouth DDH-87-5							
	A							
	87-5-10	26.00%	260.00%	25.30%	253.00%	7.24%	72.40%	2.38%
	87-5-20	30.50%	305.00%	18.30%	183.00%	5.08%	50.80%	2.88%
	87-5-30	20.70%	207.00%	31.20%	312.00%	10.70%	107.00%	2.09%
	87-5-40	21.70%	217.00%	31.00%	310.00%	9.56%	95.60%	1.54%
	87-5-50	19.80%	198.00%	32.00%	320.00%	10.70%	107.00%	1.73%
	87-5-60	22.60%	231.65%	27.50%	281.88%	7.88%	80.77%	2.30%
	87-5-70	26.30%	256.43%	18.60%	181.35%	5.10%	49.73%	2.72%
	87-5-80	25.40%	201.17%	19.90%	157.61%	4.67%	36.99%	2.40%
	87-5-87	25.00%	177.00%	24.40%	172.75%	8.64%	61.17%	2.30%
	87-5-95	25.00%	129.25%	31.00%	160.27%	10.00%	51.70%	2.08%
	87-5-100	27.40%	214.54%	18.10%	141.72%	3.34%	26.15%	3.70%
	87-5-108	23.50%	235.00%	26.90%	269.00%	8.93%	89.30%	2.55%
	87-5-118	27.60%	276.00%	24.10%	241.00%	7.44%	74.40%	2.51%
	87-5-128	31.40%	314.00%	20.90%	209.00%	6.55%	65.50%	3.40%
	87-5-138	24.90%	327.93%	29.10%	383.25%	9.02%	118.79%	2.45%
	87-5-151	21.20%	187.20%	33.30%	294.04%	10.20%	90.07%	2.60%
	87-5-160*	21.10%	211.00%	33.50%	335.00%	10.70%	107.00%	2.41%
	87-5-170	27.30%	54.60%	28.50%	57.00%	9.47%	18.94%	2.32%
	87-5-160*	21.10%	168.80%	33.50%	268.00%	10.70%	85.60%	2.41%
	87-5-180	23.40%	468.00%	35.80%	716.00%	10.30%	206.00%	1.88%
@Total A	Total A	491.90%	4,639.56%	542.90%	5,245.86%	166.22%	1,594.90%	48.65%
Total A/190	Average A	2.59%	24.42%	2.86%	27.61%	0.87%	8.39%	0.26%
	*Includes 160-170 and 172-180							
	B							
	87-5-200	34.00%	680.00%	21.50%	430.00%	5.37%	107.40%	4.97%
	87-5-220	29.70%	594.00%	28.00%	560.00%	8.27%	165.40%	2.39%
	87-5-240	37.40%	187.00%	22.10%	110.50%	5.65%	28.25%	3.10%
	87-5-245	40.10%	401.00%	20.20%	202.00%	4.81%	48.10%	2.76%
	87-5-255	31.40%	628.00%	24.10%	482.00%	7.26%	145.20%	2.95%
	87-5-275	32.60%	652.00%	19.60%	392.00%	6.05%	121.00%	4.25%

PLYMOUTH DDH-87-5
ASSAYS - UNIT SUBDIVISION

Formulas		CaO*"Length (ft)" CaCalc	MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc
	Plymouth DDH-87-5							
	A							
	87-5-10	23.80%	1.95%	19.50%	0.64%	6.40%	0.48%	4.80%
	87-5-20	28.80%	1.65%	16.50%	0.45%	4.50%	0.76%	7.60%
	87-5-30	20.90%	2.06%	20.60%	1.72%	17.20%	1.83%	18.30%
	87-5-40	15.40%	2.09%	20.90%	1.00%	10.00%	1.83%	18.30%
	87-5-50	17.30%	3.64%	36.40%	1.02%	10.20%	1.46%	14.60%
	87-5-60	23.58%	3.99%	40.90%	0.26%	2.67%	1.44%	14.76%
	87-5-70	26.52%	2.29%	22.33%	0.48%	4.68%	1.26%	12.29%
	87-5-80	19.01%	1.71%	13.54%	0.60%	4.75%	1.07%	8.47%
	87-5-87	16.28%	4.24%	30.02%	0.54%	3.82%	0.68%	4.81%
	87-5-95	10.75%	2.87%	14.84%	1.18%	6.10%	1.08%	5.58%
	87-5-100	28.97%	1.18%	9.24%	0.35%	2.74%	0.17%	1.33%
	87-5-108	25.50%	2.15%	21.50%	1.53%	15.30%	0.87%	8.70%
	87-5-118	25.10%	2.39%	23.90%	0.89%	8.90%	0.72%	7.20%
	87-5-128	34.00%	1.47%	14.70%	0.56%	5.60%	0.88%	8.80%
	87-5-138	32.27%	1.86%	24.50%	1.70%	22.39%	1.01%	13.30%
	87-5-151	22.96%	1.96%	17.31%	2.58%	22.78%	1.83%	16.16%
	87-5-160*	24.10%	2.45%	24.50%	2.43%	24.30%	2.55%	25.50%
	87-5-170	4.64%	2.52%	5.04%	1.03%	2.06%	2.87%	5.74%
	87-5-160*	19.28%	2.45%	19.60%	2.43%	19.44%	2.55%	20.40%
	87-5-180	37.60%	2.71%	54.20%	2.56%	51.20%	1.78%	35.60%
@Total A	Total A	456.76%	47.63%	450.01%	23.95%	245.03%	27.12%	252.25%
Total A/190	Average A	2.40%	0.25%	2.37%	0.13%	1.29%	0.14%	1.33%
	*Includes 160-170 and 172-180							
	B							
	87-5-200	99.40%	1.50%	30.00%	0.81%	16.24%	1.10%	22.00%
	87-5-220	47.80%	2.09%	41.80%	1.58%	31.60%	1.84%	36.80%
	87-5-240	15.50%	1.60%	8.00%	1.23%	6.15%	1.10%	5.50%
	87-5-245	27.60%	1.56%	15.60%	0.83%	8.30%	1.05%	10.50%
	87-5-255	59.00%	2.23%	44.60%	1.05%	21.00%	1.37%	27.40%
	87-5-275	85.00%	1.65%	33.00%	0.95%	19.00%	0.95%	19.00%

PLYMOUTH DDH-87-5
ASSAYS - UNIT SUBDIVISION

Formulas → / V		TiO2	TiO2*"Length (ft)" TiCalc	P2O5	P2O5*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc
	Plymouth DDH-87-5						
	A						
	87-5-10	0.33%	3.30%	1.16%	11.60%	17.40%	174.00%
	87-5-20	0.23%	2.30%	1.51%	15.10%	21.60%	216.00%
	87-5-30	0.47%	4.70%	0.96%	9.60%	15.90%	159.00%
	87-5-40	0.42%	4.20%	0.72%	7.20%	16.70%	167.00%
	87-5-50	0.45%	4.50%	0.81%	8.10%	14.40%	144.00%
	87-5-60	0.34%	3.49%	1.05%	10.76%	20.20%	207.05%
	87-5-70	0.21%	2.05%	1.24%	12.09%	24.00%	234.00%
	87-5-80	0.21%	1.66%	1.13%	8.95%	23.20%	183.74%
	87-5-87	0.38%	2.69%	1.19%	8.43%	16.80%	118.94%
	87-5-95	0.42%	2.17%	C.99%	5.12%	14.00%	72.38%
	87-5-100	0.13%	1.02%	1.13%	8.85%	21.70%	169.91%
	87-5-108	0.37%	3.70%	1.06%	10.60%	15.50%	155.00%
	87-5-118	0.32%	3.20%	1.06%	10.60%	16.20%	162.00%
	87-5-128	0.28%	2.80%	1.68%	16.80%	15.00%	150.00%
	87-5-138	0.39%	5.14%	1.18%	15.54%	14.50%	190.97%
	87-5-151	0.44%	3.89%	0.84%	7.42%	10.30%	90.95%
	87-5-160*	0.48%	4.80%	0.85%	8.50%	8.62%	86.20%
	87-5-170	0.42%	0.84%	1.14%	2.28%	9.08%	18.16%
	87-5-160*	0.48%	3.84%	0.85%	6.80%	8.62%	68.96%
	87-5-180	0.43%	8.60%	1.00%	20.00%	6.93%	138.60%
@Total A	Total A	7.20%	68.88%	21.55%	204.33%	310.65%	2,906.86%
Total A/190	Average A	0.04%	0.36%	0.11%	1.08%	1.64%	15.30%
	*Includes 160-170 and 172-180						
	B						
	87-5-200	0.23%	4.60%	1.70%	34.00%	9.00%	180.00%
	87-5-220	0.36%	7.20%	1.22%	24.40%	7.47%	149.40%
	87-5-240	0.24%	1.20%	2.00%	10.00%	7.62%	38.10%
	87-5-245	0.21%	2.10%	1.54%	15.40%	7.08%	70.80%
	87-5-255	0.31%	6.20%	1.32%	26.40%	8.54%	170.80%
	87-5-275	0.27%	5.40%	1.56%	31.20%	8.62%	172.40%

PLYMOUTH DDH-87-5
ASSAYS - UNIT SUBDIVISION

Formulas → / V		From (ft)	To (ft)	"To (ft)"-"From (ft)" Length (ft)	MnO	MnO/1.291 Mn	MnO*"Length (ft)" MnOCalc	Mn*"Length (ft)" MnCalc
	87-5-295	295.00	305.30	10.30	13.20%	10.22%	135.96%	105.31%
	87-5-305	305.30	315.00	9.70	18.20%	14.10%	176.54%	136.75%
	87-5-315	315.00	335.00	20.00	17.50%	13.56%	350.00%	271.11%
	87-5-335	335.00	356.50	21.50	12.90%	9.99%	277.35%	214.83%
	87-5-356	356.50	370.00	13.50	14.30%	11.08%	193.05%	149.54%
@Total B	Total B	3041.80	3211.80	170.00	192.20%	148.88%	3,001.90%	2,325.25%
Total B/170	Average B	17.89	18.89	1.00	1.13%	0.88%	17.66%	13.68%
	C							
	87-5-370	370.00	390.00	20.00	4.29%	3.32%	85.80%	66.46%
	87-5-390	390.00	410.00	20.00	2.95%	2.29%	59.00%	45.70%
	87-5-410	410.00	430.00	20.00	5.55%	4.30%	111.00%	85.96%
	87-5-430	430.00	440.00	10.00	7.98%	6.18%	79.80%	61.81%
@Total C	Total C	1600.00	1670.00	70.00	20.77%	16.09%	335.60%	259.95%
Total C/70	Average C	22.86	23.86	1.00	0.30%	0.23%	4.79%	3.71%
@Total "Plymouth DDH-87-5"-Average A-Average B-Average C	Total	1927.76	2115.76	188.00	3.04	2.36	28.51	22.09
Total/430	Average Value	4.48	4.92	0.44	0.71%	0.55%	6.63%	5.14%

Maritime Resource Research Limited

PLYMOUTH DDH-87-5
ASSAYS - UNIT SUBDIVISION

Formulas → / V		Fe2O3	Fe2O3*"Length (ft)" FeCalc	SiO2	SiO2*"Length (ft)" SiCalc	AL2O3	AL2O3*"Length (ft)" ALCalc	CaO
	87-5-295	22.10%	227.63%	35.50%	365.65%	11.50%	118.45%	1.67%
	87-5-305	31.10%	301.67%	25.10%	243.47%	7.32%	71.00%	3.06%
	87-5-315	33.70%	674.00%	20.60%	412.00%	5.17%	103.40%	4.79%
	87-5-335	22.90%	492.35%	32.80%	705.20%	9.79%	210.49%	3.45%
	87-5-356	19.80%	267.30%	33.50%	452.25%	10.60%	143.10%	2.05%
@Total B	Total B	334.80%	5,104.95%	283.00%	4,355.07%	81.79%	1,261.79%	35.44%
Total B/170	Average B	1.97%	30.03%	1.66%	25.62%	0.48%	7.42%	0.21%
	C							
	87-5-370	12.60%	252.00%	49.00%	980.00%	17.00%	340.00%	0.82%
	87-5-390	12.50%	250.00%	51.30%	1,026.00%	17.40%	348.00%	0.55%
	87-5-410	13.30%	266.00%	47.10%	942.00%	16.10%	322.00%	0.90%
	87-5-430	11.50%	115.00%	45.30%	453.00%	15.40%	154.00%	1.64%
@Total C	Total C	49.90%	883.00%	192.70%	3,401.00%	65.90%	1,164.00%	3.91%
Total C/70	Average C	0.71%	12.61%	2.75%	48.59%	0.94%	16.63%	0.06%
@Total "Plymouth DDH-87-5"- Average A-Average B-Average C	Total	4.89	45.97	5.38	51.72	1.65	15.71	0.48
Total/430	Average Value	1.14%	10.69%	1.25%	12.03%	0.38%	3.65%	0.11%

Maritime Resource Research Limited

PLYMOUTH DDH-87-5
ASSAYS - UNIT SUBDIVISION

Formulas → / V		CaO*"Length (ft)" CaCalc	MgO	MgO*"Length (ft)" MgCalc	Na2O	Na2O*"Length (ft)" NaCalc	K2O	K2O*"Length (ft)" KCalc
	87-5-295	17.20%	2.91%	29.97%	2.32%	23.90%	2.14%	22.04%
	87-5-305	29.68%	2.29%	22.21%	1.33%	12.90%	0.99%	9.60%
	87-5-315	95.80%	1.29%	25.80%	0.77%	15.40%	1.15%	23.00%
	87-5-335	74.18%	2.27%	48.81%	2.30%	49.45%	1.79%	38.49%
	87-5-356	27.68%	4.06%	54.81%	0.97%	13.10%	1.24%	16.74%
@Total B	Total B	578.83%	23.45%	354.60%	14.14%	217.03%	14.72%	231.07%
Total B/170	Average B	3.40%	0.14%	2.09%	0.08%	1.28%	0.09%	1.36%
	C							
	87-5-370	16.40%	2.93%	58.60%	1.39%	27.80%	4.07%	81.40%
	87-5-390	11.00%	3.01%	60.20%	1.43%	28.60%	4.01%	80.20%
	87-5-410	18.00%	3.14%	62.80%	0.99%	19.80%	3.79%	75.80%
	87-5-430	16.40%	2.57%	25.70%	0.89%	8.90%	3.81%	38.10%
@Total C	Total C	61.80%	11.65%	207.30%	4.70%	85.10%	15.68%	275.50%
Total C/70	Average C	0.88%	0.17%	2.96%	0.07%	1.22%	0.22%	3.94%
@Total "Plymouth DDH-87-5"-Average A-Average B-Average C	Total	4.52	0.47	4.45	0.24	2.43	0.27	2.47
Total/430	Average Value	1.05%	0.11%	1.03%	0.06%	0.56%	0.06%	0.57%

Maritime Resource Research Limited

PLYMOUTH DDH-87-5
ASSAYS - UNIT SUBDIVISION

Formulas → / V		TiO2	TiO2*"Length (ft)" TiCalc	P2O5	P2O5*"Length (ft)" PCalc	LOI	LOI*"Length (ft)" LOICalc
	87-5-295	0.48%	4.94%	0.78%	8.03%	7.31%	75.29%
	87-5-305	0.32%	3.10%	1.42%	13.77%	8.70%	84.39%
	87-5-315	0.24%	4.80%	1.80%	36.00%	12.50%	250.00%
	87-5-335	0.42%	9.03%	0.91%	19.57%	9.77%	210.06%
	87-5-356	0.44%	5.94%	0.79%	10.67%	12.10%	163.35%
@Total B	Total B	3.52%	54.52%	15.04%	229.44%	98.71%	1,564.59%
Total B/170	Average B	0.02%	0.32%	0.09%	1.35%	0.58%	9.20%
	C						
	87-5-370	0.66%	13.20%	0.31%	6.20%	6.08%	121.60%
	87-5-390	0.68%	13.60%	0.24%	4.80%	5.31%	106.20%
	87-5-410	0.64%	12.80%	0.31%	6.20%	7.47%	149.40%
	87-5-430	0.59%	5.90%	0.39%	3.90%	9.00%	90.00%
@Total C	Total C	2.57%	45.50%	1.25%	21.10%	27.86%	467.20%
Total C/70	Average C	0.04%	0.65%	0.02%	0.30%	0.40%	6.67%
@Total "Plymouth DDH-87-5"- Average A-Average B-Average C	Total	0.07	0.68	0.21	2.03	3.10	28.91
Total/430	Average Value	0.02%	0.16%	0.05%	0.47%	0.72%	6.72%

Maritime Resource Research Limited

APPENDIX NUMBER 4

Tonnage Factors And Calculations

TONNAGE FACTORS
WOODSTOCK - PLYMOUTH OREBODY

Mn = 125.88 Mg = 40.3 LI = 31
Fe = 159.7 Na = 61.98
Si = 60.09 K = 94.196
Al = 101.96 Ti = 79.9
Ca = 56.08 P = 141.948

Formulas ——>											MnO*Mn	Fe2O3*Fe
V	MnO	Fe2O3	SiO2	Al2O3	CaO	MgO	Na2O	K2O	TiO2	P2O5	LOI	MnC	FeC
Plymouth DDh-87-2													
87-2-A	2.43%	8.69%	52.41%	16.66%	3.16%	3.70%	1.13%	4.04%	0.70%	0.13%	6.65%	305.89%	1,387.79%
87-2-B	13.66%	22.97%	30.47%	9.53%	2.78%	2.41%	0.72%	1.88%	0.42%	1.02%	13.62%	1,719.52%	3,668.31%
87-2-C	17.83%	24.52%	27.78%	7.93%	2.70%	3.06%	0.28%	0.66%	0.34%	1.20%	13.85%	2,244.44%	3,915.84%
Plymouth DDH-87-3													
87-3-A	13.52%	21.94%	31.54%	9.75%	2.31%	2.15%	1.31%	1.65%	0.42%	0.94%	13.93%	1,701.90%	3,503.82%
87-3-B	16.17%	25.18%	25.85%	7.19%	2.84%	2.54%	0.42%	1.12%	0.31%	1.14%	17.24%	2,035.48%	4,021.25%
Plymouth DDH-87-4													
87-4-A	15.08%	25.60%	29.04%	8.89%	2.59%	2.02%	1.07%	1.51%	0.39%	1.16%	12.44%	1,898.27%	4,088.32%
87-4-B	3.75%	11.96%	51.07%	17.34%	0.49%	2.91%	1.61%	3.84%	0.69%	0.24%	5.58%	472.05%	1,910.01%
87-4-C	14.26%	22.91%	32.82%	10.19%	2.30%	2.61%	1.68%	1.79%	0.45%	0.96%	9.53%	1,795.05%	3,658.73%
Plymouth DDh-87-5													
87-5-A	15.12%	24.42%	27.61%	8.39%	2.40%	2.37%	1.29%	1.33%	0.36%	1.08%	15.30%	1,903.31%	3,899.87%
87-5-B	17.66%	30.03%	25.62%	7.42%	3.40%	2.09%	1.28%	1.36%	0.32%	1.35%	9.20%	2,223.04%	4,795.79%
87-5-C	4.79%	12.61%	48.59%	16.63%	0.88%	2.96%	1.22%	3.94%	0.65%	0.30%	6.67%	602.97%	2,013.82%
Plymouth Trench-1													
Trench-1-A	0.95%	6.93%	50.68%	15.39%	7.51%	3.48%	1.21%	3.44%	0.70%	0.09%	9.41%	119.59%	1,106.72%
Trench-1-B	18.42%	30.80%	23.61%	4.68%	2.99%	1.75%	0.04%	0.35%	0.19%	1.63%	15.54%	2,318.71%	4,918.76%
Trench-1-C	18.50%	31.60%	22.20%	4.32%	2.87%	0.95%	0.21%	0.44%	0.17%	1.41%	17.50%	2,328.78%	5,046.52%

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TONNAGE FACTORS
WOODSTOCK - PLYMOUTH OREBODY

Mn = 125.88 Mg = 40.3 LI = 31
Fe = 159.7 Na = 61.98
Si = 60.09 K = 94.196
Al = 101.96 Ti = 79.9
Ca = 56.08 P = 141.948

Formulas ——>	SiO2*Si	Al2O3*AL	CaO*Ca	MgO*Mg	Na2O*Na	K2O*K	TiO2*Ti	P2O5*P	LOI*Li	MnC+FeC+SiC+AlC+CaC+MgC+NaC+KC+TiC+PC+LOIC Sum
	SiC	AlC	CaC	MgC	NaC	KC	TiC	PC	LOIC	
Plymouth DDh-87-2										
87-2-A	3,149.32%	1,698.65%	177.21%	149.11%	70.04%	380.55%	55.93%	18.45%	206.15%	7,599.10%
87-2-B	1,830.94%	971.68%	155.90%	97.12%	44.63%	177.09%	33.56%	144.79%	422.22%	9,265.76%
87-2-C	1,669.30%	808.54%	151.42%	123.32%	17.35%	62.17%	27.17%	170.34%	429.35%	9,619.24%
Plymouth DDH-87-3										
87-3-A	1,895.24%	994.11%	129.54%	86.65%	81.19%	155.42%	33.56%	133.43%	431.83%	9,146.69%
87-3-B	1,553.33%	733.09%	159.27%	102.36%	26.03%	105.50%	24.77%	161.82%	534.44%	9,457.33%
Plymouth DDH-87-4										
87-4-A	1,745.01%	906.42%	145.25%	81.41%	66.32%	142.24%	31.16%	164.66%	385.64%	9,654.70%
87-4-B	3,068.80%	1,767.99%	27.48%	117.27%	99.79%	361.71%	55.13%	34.07%	172.98%	8,087.28%
87-4-C	1,972.15%	1,038.97%	128.98%	105.18%	104.13%	168.61%	35.96%	136.27%	295.43%	9,439.46%
Plymouth DDh-87-5										
87-5-A	1,659.08%	855.44%	134.59%	95.51%	79.95%	125.28%	28.76%	153.30%	474.30%	9,409.41%
87-5-B	1,539.51%	756.54%	190.67%	84.23%	79.33%	128.11%	25.57%	191.63%	285.20%	10,299.62%
87-5-C	2,919.77%	1,695.59%	49.35%	119.29%	75.62%	371.13%	51.94%	42.58%	206.77%	8,148.83%
Plymouth Trench-1										
Trench-1-A	3,045.36%	1,569.16%	421.16%	140.24%	75.00%	324.03%	55.93%	12.78%	291.71%	7,161.68%
Trench-1-B	1,418.72%	477.17%	167.68%	70.53%	2.48%	32.97%	15.18%	231.38%	481.74%	10,135.32%
Trench-1-C	1,334.00%	440.47%	160.95%	38.29%	13.02%	41.45%	13.58%	200.15%	542.50%	10,159.69%

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TONNAGE FACTORS
WOODSTOCK - PLYMOUTH OREBODY

Mn = 125.88 Mg = 40.3 LI = 31
Fe = 159.7 Na = 61.98
Si = 60.09 K = 94.196
Al = 101.96 Ti = 79.9
Ca = 56.08 P = 141.948

Formulas ——————→ 827.1954/Sum

	Tonnage Factor
Plymouth DDh-87-2	
87-2-A	10.8854
87-2-B	8.9274
87-2-C	8.5994
Plymouth DDH-87-3	
87-3-A	9.0437
87-3-B	8.7466
Plymouth DDH-87-4	
87-4-A	8.5678
87-4-B	10.2284
87-4-C	8.7632
Plymouth DDh-87-5	
87-5-A	8.7911
87-5-B	8.0313
87-5-C	10.1511
Plymouth Trench-1	
Trench-1-A	11.5503
Trench-1-B	8.1615
Trench-1-C	8.1419

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TONNAGE FACTORS
WOODSTOCK - PLYMOUTH OREBODY

Mn = 125.88 Mg = 40.3 LI = 31
Fe = 159.7 Na = 61.98
Si = 60.09 K = 94.196
Al = 101.96 Ti = 79.9
Ca = 56.08 P = 141.948

Formulas ——————>

	MnO	Fe2O3	SiO2	Al2O3	CaO	MgO	Na2O	K2O	TiO2	P2O5	LOI	MnO*Mn MnC	Fe2O3*Fe FeC
Plymouth Trench-2													
Trench-2-A	0.76%	6.94%	53.10%	16.20%	5.54%	3.98%	0.90%	3.85%	0.72%	0.09%	7.95%	95.67%	1,108.32%
Trench-2-B	8.44%	15.32%	44.31%	14.39%	1.16%	2.96%	1.19%	3.59%	0.63%	0.48%	6.56%	1,062.43%	2,446.60%
Trench-2-C	12.95%	21.65%	35.60%	10.90%	2.84%	2.30%	1.54%	1.85%	0.47%	0.92%	8.83%	1,630.15%	3,457.51%
Trench-2-D	9.40%	16.30%	43.02%	14.00%	1.34%	2.97%	2.00%	3.04%	0.60%	0.62%	5.95%	1,183.27%	2,603.11%
Trench-2-E	17.17%	30.14%	24.16%	7.51%	3.05%	1.53%	0.76%	0.96%	0.33%	1.40%	12.96%	2,161.36%	4,813.36%
Trench-2-F	12.94%	23.19%	32.04%	10.54%	2.23%	2.01%	1.13%	2.23%	0.46%	0.92%	12.05%	1,628.89%	3,703.44%
Trench-2-G	17.61%	28.06%	23.69%	6.50%	2.74%	2.01%	0.47%	0.92%	0.28%	1.32%	16.46%	2,216.75%	4,481.18%

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TONNAGE FACTORS
WOODSTOCK - PLYMOUTH OREBODY

Mn = 125.88 Mg = 40.3 LI = 31
Fe = 159.7 Na = 61.98
Si = 60.09 K = 94.196
Al = 101.96 Ti = 79.9
Ca = 56.08 P = 141.948

Formulas ——>	SiO2*Si	Al2O3*AL	CaO*Ca	MgO*Mg	Na2O*Na	K2O*K	TiO2*Ti	P2O5*P	LOI*Li	MnC+FeC+SiC+AlC+CaC+MgC+NaC+KC+TiC+PC+LOIC	M
V	SiC	AlC	CaC	MgC	NaC	KC	TiC	PC	LOIC	Sum	
Plymouth Trench-2											
Trench-2-A	3,190.78%	1,651.75%	310.68%	160.39%	55.78%	362.65%	57.53%	12.78%	246.45%	7,252.78%	
Trench-2-B	2,662.59%	1,467.20%	65.05%	119.29%	73.76%	338.16%	50.34%	68.14%	203.36%	8,556.92%	
Trench-2-C	2,139.20%	1,111.36%	159.27%	92.69%	95.45%	174.26%	37.55%	130.59%	273.73%	9,301.76%	
Trench-2-D	2,585.07%	1,427.44%	75.15%	119.69%	123.96%	286.36%	47.94%	88.01%	184.45%	8,724.45%	
Trench-2-E	1,451.77%	765.72%	171.04%	61.66%	47.10%	90.43%	26.37%	198.73%	401.76%	10,189.30%	
Trench-2-F	1,925.28%	1,074.66%	125.06%	81.00%	70.04%	210.06%	36.75%	130.59%	373.55%	9,359.32%	
Trench-2-G	1,423.53%	662.74%	153.66%	81.00%	29.13%	86.66%	22.37%	187.37%	510.26%	9,854.66%	

Maritime Resource Research Limited

TONNAGE FACTORS
WOODSTOCK - PLYMOUTH OREBODY

Mn = 125.88	Mg = 40.3	LI = 31
Fe = 159.7	Na = 61.98	
Si = 60.09	K = 94.196	
Al = 101.96	Ti = 79.9	
Ca = 56.08	P = 141.948	

Formulas ——————→827.1954/Sum

	Tonnage Factor
Plymouth Trench-2	
Trench-2-A	11.4052
Trench-2-B	9.6670
Trench-2-C	8.8929
Trench-2-D	9.4814
Trench-2-E	8.1183
Trench-2-F	8.8382
Trench-2-G	8.3940

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APPENDIX NUMBER 5

Thin Section Records

M.R.R. MARITIME RESOURCE RESEARCH LTD.

THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-2-31
Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —
Drill Core Sample # 87-2-31
Location: DDH-87-2
31 feet
down hole

Petrologist: D. Prince Date: Jan 26, 88
Regular/Polished: Transmitted thin

PETROLOGY
Rock Type: Blue Grey Calcareous Siltstone (Map Unit I)

	MINERALS PRESENT	%	COMMENMTS
1.	quartz	5-6%	occurs as porphyroblasts
2.	(calcite), carbonates	85%	comprise the matrix of the section
3.	sericite-muscovite	2%	
4.	limonite coatings	5-6%	probably includes Mn oxide coatings
5.	opaques	2%	magnetite, hematite
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: This thin section exhibits recrystalizational grain growth of the predominate carbonate phases from the original microcrystalline calcite-dolomite
GRAIN SIZE: original calcite grains average $1-5 \times 10^{-2}$ millimeters, regrown grain attain $15-20 \times 10^{-2}$ millimeters
ALTERATION: Other than the secondary oxidation of iron oxide this unit has undergone little chemical-mineralogical change

GENERAL COMMENTS < STRUCTURE > :

This calcareous siltstone exhibits conjugate shearing across the original bedding cleavage plane. The conjugate shears are realigning boudinaged carbonate beds, however the associated quartz porphyroblasts exhibit no evidence of strain upon extinction.

M.R.R. MARITIME RESOURCE RESEARCH LTD.

THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-2-100.8
Property: Plymouth, Woodstock N.T.S. 21-J-4-E

Outcrop Number _____ Location: DDH-87-2
Drill Core Sample # 87-2-100.8 -100'6" - 102'6"
downhole

Petrologist: D. Prince Date: Jan 5, 1988
Regular/Polished: Transmitted thin

PETROLOGY
Rock Type: Maroon-Red Siltstone (Iron Formation) (Map Unit IIa)

	MINERALS PRESENT	%	COMMENMTS
1.	Stipnomelane	3%	pleochroic golden brown to clear, moderate
2.	rutile	>1%	occurs within the quartz
3.	quartz	5%	undulose extinction common, polycrystalline
4.	opaque iron formation	80%	exhibits bedding, ie. original textures preserved
5.	sphene	>1%	
6.	Tephroite ?	2%	identification not verified
7.	epidote - chlorite	7%	" " "
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: the original iron formation exhibits open folding of the bedding cleavage. The identified minerals ① and ② are fiberous. ③ polycrystalline fine grain octahedrons
GRAIN SIZE: The iron formation is aphanitic and opaque; Stipno averages 0.40mm rutile averages 0.10mm, sphene 0.05mm, quartz
ALTERATION: The minerals no. ①, ② and ③ are all secondary. These cross-cut the original siltstone at a low angle to bedding

THIN SECTION NUMBER:_____ PROPERTY:_____

GENERAL COMMENTS < STRUCTURE > :

M.R.R. MARITIME RESOURCE RESEARCH LTD.

THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-2-131 5

Property: Plymouth Woodstock N.T.S. 21-J-4

Outcrop Number _____ Location: DDH-87-2

Drill Core Sample # 87-2-131-5 131' to 132'

down hole

Petrologist: D. Primre Date: Jan 5, 1988

Regular/Polished: Polished Thin

PETROLOGY

Rock Type: Inter bedded maroon red and black siltstone, (Map Unit II a)

*	MINERALS PRESENT	*	%	*	COMMENMTS	*
1.	Magnetite - M	*	50%	*		*
2.	hematite	*	35%	*	occurs as replacements of magnetite	*
3.	Manganite - Pyrolusite	*	10%	*	aggregate within the magnetite predominately	*
4.	Saussurite	*	5%	*	aggregate of chlorite, quartz, albite, sphene	*
5.		*		*	and calcite? zoisite, all occur as 2nd ary	*
6.		*		*	products of potassic? feldspars in veins	*
7.	Yellow 2nd ary mineral	*	> 1%	*	Tephroite?, axinite?	*
8.		*		*		*
9.		*		*		*
10.		*		*		*
11.		*		*		*
12.		*		*		*
13.		*		*		*
14.		*		*		*
15.		*		*		*

TEXTURES: Saussuration of secondary feldspars create a cloudy fine grained fibrous mass the ore textures exhibit warping of stratigraphic bedding

GRAIN SIZE: The saussurite mass averages 0.05mm per grain. The polygonal magnetite hematite averages 10 - 20 micrometers.

ALTERATION: Saussuration makes identification of the original vein material and secondary byproducts very difficult

THIN SECTION NUMBER: 87-2-131.5 PROPERTY: Plymouth

GENERAL COMMENTS < STRUCTURE > :

The secondary veining along a foliation plane appears to be dilated due to the fold hinge failure of iron beds. Shearing and overall displacement of the bed occur along this slip plane, (foliation), direction.

The magnetite and hematite within this shale occur as polygonal masses with an average grain size of 10-20 micrometers.

Typically they are segregated into 2 mm - 10 mm bands of alternating hematite and magnetite however lens of hematite do occur within the magnetite bands.

M.R.R. MARITIME RESOURCE RESEARCH LTD.

THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-2-154.8
Property: Plymouth N.T.S. 21-5-4

Outcrop Number _____ Location: DDH-87-2
Drill Core Sample # _____ 154'8"
downhole

Petrologist: D. Prince Date: Jan 6, 1988
Regular/Polished: Transmitted Thin

PETROLOGY

Rock Type: Interbedded maroon red and buff red siltstone. (Map Unit IIa)

*	MINERALS PRESENT	*	%	*	COMMENMTS	*
1.	Magnetite	*	10%	*		*
2.	Saussurite-kaolinite	*	15%	*	occurs within magnetite-hematite beds as masses	*
3.	Hematite	*	60%	*		*
4.	quartz	*	3%	*	as post saussurite phases	*
5.	chlorite	*	2%	*	light green Fe-rich type, post saussurite	*
6.	relict plagioclase	*	approx 2%	*		*
7.	" potassic feldspar	*	approx 3%	*		*
8.	rhodochrosite	*	<1%	*	Pleochroic Twinning, X-nicol Twinning	*
9.		*		*	1% mineral may be muscovite	*
10.		*		*		*
11.		*		*		*
12.		*		*		*
13.		*		*		*
14.		*		*		*
15.		*		*		*

TEXTURES: The two original phases hematite and magnetite occur at a interlocking zone resembling a chemical boundary
GRAIN SIZE: the original hematite-magnetite average (0.05 to 2×10^{-2} millimeters
the secondary saussurite approaches 5×10^{-2} millimeters grains
ALTERATION: both the hematite and magnetite contain deformed porphyroblast of an aggregate of quartz, chlorite, epidote?, (saussurite)

THIN SECTION NUMBER: 87-2- 1548 PROPERTY:

GENERAL COMMENTS < STRUCTURE > :

This thin section was initially examined to view an unusual curving, wavy chemical precipitation front between brick red and maroon red siltstone. This is extremely irregular, curvy and interlocking. This suggests that a chemical front between the two red siltstones does occur and that chemical movement across this front occured

As a result of examining this chemical boundary, the reason why there are two primary color of red siltstone becomes apparent

The brick-red siltstone contains a groundmass of hematite and phyllosilicates whereas the maroon-red siltstone contains hematite-magnetite and minor isolated masses of phyllosilicates, and quartz.

The phyllosilicates, plus quartz, calcite? are replacing with albite and orthoclase feldspar. Since the groundmass of the brick-red, hematite-rich layers contain up to 30% saussurite-kaolinite alteration, this unit must have been physically more susceptible to feldspathization than the maroon red unit; in the beginning.

M.R.R. MARITIME RESOURCE RESEARCH LTD.

THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-2-169

Property: Plymouth N.T.S. 21-J-4

Outcrop Number _____ Location: DDH-87-2
169 foot
down hole

Drill Core Sample # 87-2-169

Petrologist: _____ Date: Jan 6 1988

Regular/Polished: Transm. Hed Thin

PETROLOGY

Rock Type: Interbedded Maroon red and brick red siltstone (Map Unit II a)

	MINERALS PRESENT	%	COMMENMTS
1.	hematite	60%	this phase surrounds the magnetite
2.	magnetite	15%	
3.	quartz	< 3%	several phases of quartz occur in fractures
4.	chlorite	2%	light green variety within fractures
5.	axinite	< 1%	yellowish variety
6.	Saussuritic products	20%	chlorite, quartz, epidote, muscovite, calcite
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: The iron formation exhibits very tight to isoclinal folds which are discontinuous due to late shearing

GRAIN SIZE: typically the oxide minerals and pseudomorphs of feldspars do not exceed 0.02 mm

ALTERATION: Saussuritization of preexisting feldspars occurs along predominantly a network of fractures

GENERAL COMMENTS < STRUCTURE > :

This section exhibits at least two phases of deformation represented by the very tight F_1 style folds within the iron oxide beds.

The abundant secondary phyllosilicates, micas and quartz have replaced portions of the bedding at a grain size scale. These minerals thereby enhance the folded iron formation.

Overprinting the folded sequence several generations of fractures occur, which are most often healed chlorite, quartz, muscovite and ankerite.

M.R.R. MARITIME RESOURCE RESEARCH LTD.

THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-2-188.9

Property: Plymouth Woodstock N.T.S. 21-J-4

Outcrop Number _____ Location: DDH-87-2

Drill Core Sample # 87-2-188.9 188 ft 9 inches downhole

Petrologist: D. Prince Date: Jan 6, 1988

Regular/Polished: Polished thin

PETROLOGY

Rock Type: Saussuritized iron formation (Carbonate rich) (Map Unit IIa)

	MINERALS PRESENT	%	COMMENMTS
1.	Saussurite	60%	
2.	Carbonates	30%	Rhodocrosite & calc.-dolomite 2nd'ary phase
3.	quartz	3%	occurs as a 2nd'ary phase in late fractures
4.	chlorite	2%	occurs as a 2nd'ary phase in late fractures
5.	muscovite	<1%	in association with quartz + chlorite
6.	Ore Minerals	4%	{ pyrite
7.			{ chalcopyrite exsolutions of pyrite or Hebs;
8.			{ mackinawite ? exsolutions in pyrite
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: the chlorite, chloritoid and minor muscovite exhibit an interlocking preferred orientation parallel to the original bedding-cleavage

GRAIN SIZE: The average grain size of the phyllosilicate groundmass is $5 \text{ to } 50 \times 10^{-2}$ millimeters

ALTERATION: The original groundmass of the red? iron rich siltstone has been ~~totally~~ replaced by secondary minerals

GENERAL COMMENTS < STRUCTURE > :

Within this thin section it should be noted that the pyrite grains are very anhedral, melted, and partially penetrative with the secondary phyllosilicates indicating recrystallization and angular boundaries and fractures within this sulphide indicate brittle shearing of this rock after recrystalization has occurred. It is difficult to determine whether the pyrite has replaced original iron oxides or has crystalized - recrystalized as a primary iron sulphide phase

M.R.R. MARITIME RESOURCE RESEARCH LTD.

THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-70.8
Property: Plymouth Woodstock N.T.S. 21-J-4

Outcrop Number —
Drill Core Sample # 87-3-70.8
Location: DDH-87-3 at 70.8 feet down hole

Petrologist: D. Prince Date: Jan 18, 1988
Regular/Polished: Polished Thin Section

PETROLOGY
Rock Type: Carbonaceously altered siltstone, (Map Unit II a)

	MINERALS PRESENT	%	COMMENMTS
1.	Carbonate	65%	matrix and 2nd ary vein associations
2.	chlorite	10%	matrix and vein associations
3.	muscovite	< 1%	associates with quartz veinlets
4.	plagioclase?	< 1%	
5.	quartz	3-4%	
6.	pyrite		disseminated throughout grs bedding planes and overprinting chlorite qtz veinlets.
7.			
8.			
9.	Sericite	20%	
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: inequant mosaic of mutually interlocking crystalloblastic grains of carbonate overprinting a preexisting schistosity developed in phyllosilicates.
GRAIN SIZE: ranges from $1-10 \times 10^{-2}$ millimeters within the highly altered grain matrix to 1mm grains of regrown calcite.
ALTERATION: highly carbonated and silicified red, oxide? facies iron formation

GENERAL COMMENTS < STRUCTURE > :

This thin section exhibit post crystalline deformation of the calcite matrix and veinlets filled with chlorite and quartz. The quartz undergoes undulose extinction

M.R.R. MARITIME RESOURCE RESEARCH LTD.

THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-104.8

Property: Plymouth, Woodstock **N.T.S.** 21-J-4

Outcrop Number —

Drill Core Sample # 87-3-104.8

Location: DDH-87-3
104 feet, 8 inches
downhole

Petrologist: D. Prince **Date:** Jan 26, 88

Regular/Polished: Transmitted Thin

PETROLOGY

Rock Type: Altered Maroon Red-Siltstone, (Map Unit II a)

	MINERALS PRESENT	%	COMMENMTS
1.	hematite	5-7%	occurs in bedded layers
2.	chlorite	5%	
3.	sausurrite	15-20%	quartz, sericite?, this cryptocrystalline
4.	quartz-calcite	2-3%	veinlets
5.	carbonate	55%	Extensive replacement of the
6.	talc	10%	hematite bedded sequence by the
7.			carbonate matrix is probable.
8.			Many of the calcite grains exhibit
9.			an interlocking relationship as well as
10.			secondary grain growth, however an
11.			altered lithons of quartz, chlorite
12.			and iron oxides have resisted replacement
13.			This replacement of Fe oxides by carbonates
14.			suggests an open system where bulk
15.			chemical changes have taken place.

TEXTURES: This thin section exhibits boudinaged layers parallel to the apparent bedding of the hematitic layers.

GRAIN SIZE: The 2nd ary carbonate matrix has a bimodal distribution of 5-15 x 10^{-2} mm grains and 0.01mm grains. The oxide matrix averages 1-2 x 10^{-2} mm.

ALTERATION: The boudins within this thin section are filled with primary or secondary carbonates and possibly minor phosphates
Perhaps these boudins are primary ooloids rather than a structural feature.

GENERAL COMMENTS < STRUCTURE > :

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-128.1
Property: Plymouth, Woodstock N.T.S. 21-5-4

Outcrop Number —
Drill Core Sample # 87-3-128.1
Location: DDH-87-3
128 feet 1 inch
downhole

Petrologist: D. Prince Date: Jan 26, 88
Regular/Polished: Transmitted thin

PETROLOGY
Rock Type: Potassically Altered red siltstone (Map Unit II a)

	MINERALS PRESENT	%	COMMENMTS
1.	Muscovite (sericite)	45%	The groundmass is composed of
2.	quartz	5%	very fine phyllosilicates SiO_2 and
3.	chlorite	25%	carbonate. The exhibits a well
4.	calcite	5%	developed foliation plane
5.	epidote ?	< 1%	
6.	quartz	5%	Porphyroblasts
7.	carbonate (Mn-calcite)	10%	
8.	opaque, oxides	3%	hematite, possibly brownite
9.	orthoclase	< 2%	albite
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: This thin section exhibits a well developed phyllosilicate matrix with abundant porphyroblasts of quartz and carbonate
GRAIN SIZE: The matrix averages $1-3 \times 10^{-2}$ mm, the porphyroblasts average $5-10 \times 10^{-2}$ mm
ALTERATION: This thin section exhibits widespread potassic alteration in association with carbonitization

GENERAL COMMENTS < STRUCTURE > :

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-148.6

Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —

Location: DDH-87-3, 148 feet 6 inches downhole

Drill Core Sample # 87-3-148.6

Petrologist: D. Prince Date: Jan 18, 1988

Regular/Polished: Polished Thin

PETROLOGY

Rock Type: Brick-Red Pyritiferous siltstone (Map Unit IIa)

*	MINERALS PRESENT	%	COMMENMTS
1.	saussurite-carbonate	50%	- microcrystalline groundmass
2.	quartz	3%	} occur with secondary veinlets
3.	chlorite	2%	} around pyrite grains
4.	hematite	40%	-
5.	pyrite	3-4%	
6.	sphene	<1%	minor phase in quartz-chlorite veins
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: An interlocking anhedral-crystalloblastic array of saussurite and calcite are overprinting the original hematite rich bedding planes

GRAIN SIZE: the hematite grains range from 10's of micrometers to 10-30x10⁻² mm whereas the calcite, qtz, chlorite, pyrite and saussurite exceed 1.0 micrometers

ALTERATION: Saussuritization/carbonation is very widespread making mineral identification of minerals within the groundmass impossible

GENERAL COMMENTS < STRUCTURE > :

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-171.2

Property: Plymouth-Woodstock N.T.S. 21-J-4

Outcrop Number —

Drill Core Sample # 87-3-171.2

Location: DDH-87-2
171 feet 8 inches
downhole

Petrologist: D. Prince Date: January 18, 1988

Regular/Polished: Transmitted Thin

PETROLOGY

Rock Type: Carbonaceously altered Siltstone (Map Unit IIa)

	MINERALS PRESENT	%	COMMENMTS
1.	Sericite-carbonate	80%	appears to be dominantly carbonate
2.	chlorite	10%	associated with the veining
3.	calcite	3-4%	associated with the veinlets
4.	Apatite	5-6%	can range in color from green, yellow to orange
5.	quartz	2%	contained within veins
6.	replacement hematite	< 2%	relict bedding within the matrix of sericite-carbonate
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: The section consists of an anhedral interlocking crystalline matrix of mineral 1 overprinting the relict hematite rich red beds mudstone boundstone.

GRAIN SIZE: The ground mass consists of 1-20x10^{-2} mm. grains, within the boudinaged (oolitic-like!) masses the grain size does not increase.

ALTERATION: This section is 95% overprinted by a carbonate-phyllosilicate ground mass without preferred orientation

GENERAL COMMENTS < STRUCTURE > :

This thin section exhibits what has been interpretated a boudinaged structures within the cave.

Many bedding sequences exhibit these boudin and pinch and swell structures all the way from proto-boudins-like beds to chocolate-block boudin structures.

The possiblity that these are in fact oolites exists however the observation of the macro scale development stages of the various boudins maker this observer think that this is un-likely.

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-232.5
Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —
Drill Core Sample # 87-3-232.5
Location: DDH 87-3 232 feet Similar downhole

Petrologist: D. Prince Date: Jan 19, 88
Regular/Polished: Transmitted Thin

PETROLOGY

Rock Type: Grey-Green Siltstone (Map Unit 2a)

	MINERALS PRESENT	%	COMMENMTS
1.	Sausurrite-carbonate	90%	forms the matrix of the rock
2.	actinolite	5%	occurs as discrete isolated blades
3.	stipnomelane	<1%	occurs as discrete isolated blades
4.	chlorite	<1%	occurs within fractures with quartz
5.	quartz	<2%	associated with chlorite with veinlets
6.	opaque-oxides	1%	disseminated euhedral crystals
7.	poikiloblastic-apatite?	<1%	+ isotropic, not a property of phosphates
8.			in general
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: The matrix occurs as a very fine grained mutually interlocking array with poikiloblasts of anhedral apatite.
GRAIN SIZE: matrix range $1-10 \times 10^{-2}$ mm actinolite-stipnomelane 25×10^{-2} mm poikiloblasts $50-100 \times 10^{-2}$ mm.
ALTERATION: Intensive recrystallization and alteration by quartz, chlorite calcite, epidote?, muscovite within the groundmass.

GENERAL COMMENTS < STRUCTURE > :

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-315
Property: Plymouth, Woodstock N.T.S. 21-5-4

Outcrop Number —
Drill Core Sample # 87-3-315
Location: DDH-87-3, 315 feet down hole

Petrologist: D. Prince Date: Jan 19, 1988
Regular/Polished: Transmitted thin

PETROLOGY
Rock Type: Green-Black Siltstone (Map unit IIa)

	MINERALS PRESENT	%	COMMENMTS
1.	Carbonate - calcite	60%	
2.	quartz	20%	large veinings; contains healing inclusion tracks
3.	muscovite	2%	
4.	chlorite	10%	
5.	opaques	2-3%	
6.	sausserite	6-7%	
7.	zoisite	<1%	small columnar grains within quartz grains
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: An matrix of mutually interlocking cystaloblastic calcite, quartz and chlorite dominates the textures, however open folding of original bedding is observed
GRAIN SIZE: matrix, (calcite, qtz, chl.); 5-50 x 10^{-2} mm, vein quartz averages 1 to 2 mm grains, muscovite 5-10 x 10^{-2} mm, opaques 1-5 x 10^{-2} mm
ALTERATION: The pervasive carbonation and saussurization has completely obliterated the original fabric

GENERAL COMMENTS < STRUCTURE > :

Examination of this thin section at 30 power, and with the unaided eye displays that the bedding has undergone two periods of ductile folding deformation which has resulted in tight folds with an inter-limb angle of 20 degrees being refolded around broad-open folds which have inter-limb angles of 110° degrees.

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-344
Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —
Drill Core Sample # 87-3-344
Location: DDH-87-3 344' feet downhole

Petrologist: D. Prince Date: Jan 19, 1988
Regular/Polished: Polished Thin

PETROLOGY
Rock Type: Carbonated ; maroon-red siltstone (Map Unit II a)

*	MINERALS PRESENT	*	%	*	COMMENMTS	*
1.	Calcite-carbonate	*	50%	*	interlocking mutual intergrowths	*
2.	quartz	*		*	both in the matrix and veinlets.	*
3.	apatite	*	<5%	*	occurs as euhedral porkiloblasts	*
4.	Chlorite	*	5-6%	*	very fine grained vein fillings	*
5.	sausurrite	*	25%	*	composed of quartz, calcite, chlorite	*
6.	pyrite	*	< 3%	*	} secondary in the matrix and veinlets	*
7.		*		*	} contains blebs of cobaltite?	*
8.		*		*		*
9.		*		*		*
10.		*		*		*
11.		*		*		*
12.		*		*		*
13.		*		*		*
14.		*		*		*
15.		*		*		*

TEXTURES: The carbonate-sausurrite matrix occurs as a mutually interlocking crystoblastic array with anhedral to euhedral 2nd gen sulphides
GRAIN SIZE: matrix (5 - 25 x 10^{-2} mm) granoblasts of qtz-calcite and pyrite 30 - 70 x 10^{-2} mm.
ALTERATION: This rock has been pervasively carbonated, sausurrized and exhibit crystal growth and rotation away from high angle grain boundaries.

GENERAL COMMENTS < STRUCTURE > :

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-455.2
Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —
Drill Core Sample # 87-3-455.2
Location: ODH-87-3 455 feet 2 inches down hole

Petrologist: D. Prince Date: Jan 20, 1998
Regular/Polished: Transmitted This
Note: Two thin sections have been cut,

PETROLOGY

Rock Type: Intercalated Green-Black and green-grey siltstone (Map Unit IIc)

MINERALS PRESENT	%	COMMENMTS/occurrence
1. Phyllosilicate matrix	65%	chlorite, minor epidote, muscovite
2. quartz	25%	} occurs as:
3.		} 1) matrix bound within a phyllosilicate mesh
4.		2) regrown pressure shadow quartz
5.		3) within very minor veinlets
6. zircon	<1%	} within the ground mass of qtz and
7.		} phyllosilicates
8. opaques	5%	probably hematite, occurs as a
9.		fine disseminated dusting within
10.		the matrix
11. limonite oxide	2%	} rims many relict bedding planes
12.		} cleavage planes and as accessory
13.		} grains around the mesh-like matrix
14.		} minerals.
15. relict albite	<3%	saussuritization has occurred

TEXTURES: This section exhibits a very well developed bedding schistosity of phyllosilicates and quartz grains, a weakly developed cleavage schistosity and (over)
GRAIN SIZE: Matrix ave. ($5-20 \times 10^{-2}$ mm's), quartz augen (0.05 mm, average) rutile (0.05 mm average), opaque dust, ($1-2 \times 10^{-2}$ mm, average)
ALTERATION: This section exhibits mechanical recrystallization and reorientation of chain silicates chlorite muscovite epidote, minor saussuritization of relict plagioclase (albite), has occurred.

GENERAL COMMENTS < STRUCTURE > :

Textures (con't) minor development of tabling parallel transposition of micro-folded hinge lines

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-3-610.5
Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —
Drill Core Sample # 87-3-610.5
Location: DDH 87-3 610 feet Sinclair downhole

Petrologist: D. Prince Date: Jan 20, 1988
Regular/Polished: Transmitted Thin

PETROLOGY
Rock Type: Calcareous grey-green Siltstone, (Map Unit IIc)

*	MINERALS PRESENT	*	%	*	COMMENMTS	*
1.	phyllosilicate matrix	*	60%	*	chlorite, muscovite, epidote	*
2.	carbonate matrix	*	15%	*	secondary over the phyllosilicate matrix	*
3.	quartz	*	15%	*	occurs within the matrix and as angular	*
4.	opaques	*	3%	*		*
5.	albite	*	2%	*	saussuritized and in distinctive subgrain	*
6.		*		*	a mass of overgrowth chlorite and	*
7.		*		*	quartz.	*
8.	limonite oxide	*	5%	*	occurs as coatings along relict	*
9.		*		*	bedding cleavage	*
10.		*		*		*
11.		*		*		*
12.		*		*		*
13.		*		*		*
14.		*		*		*
15.		*		*		*

TEXTURES: The fine grained schistose phyllosilicate matrix is being replaced by large porphyroblasts of poikiloblastic carbonate (calcite, ankerite to
GRAIN SIZE: phyllosilicate matrix (5-20 micrometers), calcite masses with matrix (range from 20×10^{-2} mm to 1 millimeter)
ALTERATION: This thin section was originally a schistose siltstone which has been carbonated over a wide section of the slide

GENERAL COMMENTS < STRUCTURE > :

This thin section macroscopically and microscopically resembles the section of core from which this section 87-3-455.2 was cut from.

It is evident that the carbonate is secondarily replacing the schistose mesh-like as porphyroblasts.

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-4-14

Property: Plymouth

N.T.S. 21-5-4

Outcrop Number —

Drill Core Sample # 87-4-14

Location: DDH-87-4
14 feet
downhole

Petrologist: D Prince

Date: Jan 20, 1988

Regular/Polished: Transmitted Thin

PETROLOGY

Rock Type: Carbonaceously altered grey-green siltstone
(Map Unit IIb)

	MINERALS PRESENT	%	COMMENMTS
1.	chlorite	70%	
2.	quartz	20%	
3.	alkali feldspar	7-8%	
4.	muscovite	<2%	
5.	opaques	<2%	
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: A weakly developed schistosity exists between the alignment of the phyllosilicates and fine alkali feldspar-quartz

GRAIN SIZE: the groundmass of chlorite, quartz, muscovite and feldspar averages 2-5 x 10^{-2} mm sausurrite aggregates ave. 0.10mm dia..

ALTERATION: Isolated sausurritized aggregate masses occur which average 0.10mm in diameter

GENERAL COMMENTS < STRUCTURE > :

It can be observed that dislocation kink bands zones are displacing the bedding cleavage and rotating aligned phyllosilicates within these zones int. a new alignedment at ≥ 45° to the bedding planes.

These dislocation zones have been termed kink folding ; F2 generation within the diamond-drill core when it was logged megascopically

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-4-39
Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —
Drill Core Sample # 87-4-39
Location: DDH-84-4, 39 feet downhole

Petrologist: D. Prince Date: Jan 20, 1988
Regular/Polished: Transmitted Thin

PETROLOGY
Rock Type: Brick-Red siltstone, (Map Unit IIb)

*	MINERALS PRESENT	*	%	*	COMMENMTS	*
1.	Opaque oxide	*	50%	*	hematite-magnetite iron formation	*
2.	Vein constituents	*	—	*	Vein material, matrix replacement material	*
3.	2a calcite	*	30%	*	2a and 2c contribute 30% of the total	*
4.	2b quartz	*	15%	*		*
5.	2c Rhodocrosite	*	*	*	* sum of 2a and 2c	*
6.	2d chlorite	*	2%	*		*
7.	2e actinolite	*	<1%	*	not positively identified	*
8.	2f opaques	*	<1%	*		*
9.	2g phosphates	*	2%	*	apatite,	*
10.		*		*		*
11.		*		*		*
12.		*		*		*
13.		*		*		*
14.		*		*		*
15.		*		*		*

TEXTURES: The original red siltstone exhibits matrix replacement by quartz-carbonate-phosphates in isolated masses and near total replacement in the veins
GRAIN SIZE: red siltstone matrix averages $1\text{-}2 \times 10^{-2}$ mm, the secondary replacement aggregate-vein material ranges from $1\text{-}2 \times 10^{-2}$ mm to 4 millimeters
ALTERATION: Extensive carbonation has occurred with minor silicification, both of which have followed a phase of brittle deformation of the original brick-red, (Fe, Mn oxide) rich siltstone.

GENERAL COMMENTS < STRUCTURE > :

The Rhodochrosite present obviously occurs as a low temperature meta somatic replacement of the original manganese oxide minerals that include braunite and rhodonite, which are intimately associated within the primary magnetite-hematite oxide assemblage as seen at macroscope mapping scale.

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-4-49
Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —
Drill Core Sample # 87-4-49
Location: DDH 87-4
419 Feet
down hole

Petrologist: D. Prince Date: Jan 20, 1988
Regular/Polished: Transmitted Thin
Two thin Sections

PETROLOGY
Rock Type: Brecciated Grey-Green Siltstone (Map Unit IIb)

	MINERALS PRESENT	%	COMMENMTS
1.	quartz	40%	
2.	carbonate	20%	predominately calcite (minor ankerite)
3.	chlorite	15%	
4.	alkali feldspar	10%	
5.	muscovite	< 3%	
6.	relict phyllosilicates	< 5%	occur along original bedding planes and alignment is enhanced by the chlorite, muscovite and feldspar laths.
7.			
8.			
9.	opaques	2%	hematite - magnetite
10.	limonite coatings	3%	
11.			
12.			
13.			
14.			
15.			

TEXTURES: the relict phyllosilicate groundmass has predominately been replaced by granoblasts of calcite, quartz and chlorite.
GRAIN SIZE: relict groundmass silicates average. $1-5 \times 10^{-2}$ mm granoblastic (qtz, calcite, chlorite) range from $1-10 \times 10^{2}$ mm to 1-3 mm grains
ALTERATION: The brecciation of grey-green siltstone was followed by silicification, chloritization and carbonation.

GENERAL COMMENTS < STRUCTURE > :

In addition to the brecciation within this section, the schist fabric exhibits a ductile deformational period in which open folding, with interlimb angles of 110-130°, occurred.

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-4-190.6
Property: Plymouth, Woodstock N.T.S. 21-5-4

Outcrop Number —
Drill Core Sample # 87-4-190.6
Location: DDH-87-4 190 feet 6 inches downhole

Petrologist: D. Prince Date: Jan 21, 1988
Regular/Polished: Transmitted Thin

PETROLOGY

Rock Type: Green-Black Siltstone (Map Unit II a)

*	MINERALS PRESENT	*	%	*	COMMENMTS	*
1.	hematite-braunite	*	50%	*	finely intergrown mesh network	*
2.	quartz	*	<3%	*	occurs along minor veinlets	*
3.	sauussurite	*	7-8%	*	chlorite, quartz, epidote, calcite	*
4.	calcite-rhodocrosite	*	40%	*	occur in association with the	*
5.		*		*	quartz in veinlets and within	*
6.		*		*	secondary anhedral masses which	*
7.		*		*	are overgrowing the Fe-Mn opaque	*
8.		*		*	layered groundmass	*
9.		*		*		*
10.		*		*		*
11.		*		*		*
12.		*		*		*
13.		*		*		*
14.		*		*		*
15.		*		*		*

TEXTURES: The original bedded hematite rich groundmass contains numerous porphyroblasts of carbonate (calcite, rhodocrosite)
GRAIN SIZE: The hematite-magnetite groundmass ranges from 1-5 $\times 10^{-2}$ mm sized grains
ALTERATION: This area of green-black siltstone has undergone extensive carbonation.

GENERAL COMMENTS < STRUCTURE > :

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-4-464

Property: Plymouth, Woodstock N.T.S. 21-5-4

Outcrop Number —

Drill Core Sample # 87-4-464

Location: DDH-87-4
464 feet
downhole

Petrologist: D. Prince Date: Jan. 21, 1988

Regular/Polished: Transmitted Thin
Two Sections cut.

PETROLOGY

Rock Type: Maroon-Red Siltstone (Map Unit IIa)

	MINERALS PRESENT	%	COMMENMTS
1.	hematite-magnetite	30%	layered original rock mass, included [illegible]
2.	carbonate	60%	calcite-rhodocrosite; granular replacement
3.	chlorite	2-3%	contained within 2ndary fractures
4.	oxinite	< 1%	mostly within 2ndary veinlets
5.	alkali feldspar	2%	contained within 2ndary fractures
6.	quartz	2-3%	associated with the feldspar
7.	muscovite	< 1%	" " "
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: This section displays grain growth of aggregates of coarse to fine grained carbonate, porphyroblasts at various stages of development

GRAIN SIZE: oxide matrix, averages 10-20 micrometers, & carbonate matrix averages 3-4 $\times 10^{-2}$ mm.

ALTERATION: The overprinting of the Mn-Fe oxide bearing sequence by carbonatization is very extensive and intense

GENERAL COMMENTS < STRUCTURE > :

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-4-511.5

Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number — Location: DDH-87-4 511 feet 5 inches down hole

Drill Core Sample # 87-4-511.5

Petrologist: D. Prince Date: Jan 25, 88

Regular/Polished: Transmitted Thin

PETROLOGY

Rock Type: Foliated Green-red siltstone, (Map Unit IIa)

	MINERALS PRESENT	%	COMMENMTS
1.	hematite-magnetite	10%	opaque, primary bedding [illegible]
2.	stipnomelane	<1%	within the hematite magnetite
3.	albite, calcite, qtz	<5%	porphyroblasts within the matrix
4.	quartz } matrix	85%	extremely fine grained, with a
5.	chlorite } matrix		moderately well developed foliation
6.	muscovite } matrix		
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: This thin section exhibits a moderately well developed foliation plane in which larger grains of quartz and magnetite, and minor feldspar and (ver

GRAIN SIZE: fine grained matrix averages 2-4 x 10^{-2} mm the calcite, quartz, feldspar and oxides average 20 x 10^{-2} mm

ALTERATION: The edge of this thin section exhibits predominately a hm-mn oxide phase which appears to have been obviously replaced by the qtz, mus, chl, ab phase mechanically, perhaps by the process of mylonization.

GENERAL COMMENTS < STRUCTURE > :

Textures (con't) calcite exhibit various stages of rotational growth into the plane of the foliation, which is defined mainly by the chlorite.

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-4-517
Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —— Location: DDH-87-4
Drill Core Sample # 87-4-517 517 feet downhole

Petrologist: D. Prince Date: Jan 22, 1988
Regular/Polished: Transmitted Thin

PETROLOGY

Rock Type: Maroon-Red Siltstone (Map Unit IIa)

	MINERALS PRESENT	%	COMMENMTS
1.	Hematite-magnetite	20%	original bedded texture present
2.	pyroxmangite	10%	Structure very similar to pyroxene (1), 2V-43°
3.	muscovite	5%	large grains in pockets and boudin structures
4.	biotite-stipnomelane	15%	occurs within across-cutting foliation
5.	chlorite	10%	
6.	carbonate-phosphate	40%	Ca, Mn carbonate phase; it is very
7.			fine grained and may include
8.			large apatite component
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TEXTURES: This thin section has undergone retrograde metamorphism in which mus, bio and stipnomelane are overgrowing the pyroxmangite and these minerals in turn (over
GRAIN SIZE: carbonate-phosphate phase (1.0×10^{-2} mm, average); pyroxmangite ranges up to 1.0×10^{-1} mm
ALTERATION: The mineral pyroxmangite is being overprinted by biotite muscovite, stipnomelane, chlorite and

GENERAL COMMENTS < STRUCTURE > :

Textures (con't) are being overprinted by a late stage phase of carbonation. Since the phyllosilicates are deformed across cleavage while the carbonate phase appears undeformed then a conclusion would appear to be:

The extensive overprintings of all the iron-rich phases occurred after the peak prograde metamorphic stage. This was followed by retrograde metamorphism of the deformation and finally by carbonitization.

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THIN SECTION RECORD SHEET

THIN SECTION NUMBER: 87-4-556

Property: Plymouth, Woodstock N.T.S. 21-J-4

Outcrop Number —— Location: DDH-87-4

Drill Core Sample # 87-4-556 556 feet down hole

Petrologist: D. Prince Date: Jan 25, 88

Regular/Polished: Transmitted thin

PETROLOGY

Rock Type: Highly Altered-Brecciated Siltstone, (Map Unit II a)

	MINERALS PRESENT	%	COMMENMTS
1.	Apatite	5%	
2.	chlorite	10%	// green in color, breccia healed phase
3.	chlorite-Talc aggregate?	30%	brown-yellow tiger stripe appearance
4.	alkali feldspar	1-2%	orthoclase, laminar twinning
5.	carbonate	2-3%	breccia healed phase, probably
6.	—		mn-rich calcite and/or rhodocrosite
7.	foliated phyllosilicate	20%	finely foliated foreign, angular
8.	aggregate	—	fragments of material similar to
9.		—	87-4-511 ie. Mylonized green-red
10.		—	siltstone
11.	angular maroon-red	30%	contains boudinaged (secondary?) carbonate-
12.	bedded aggregate	—	phosphatic nodules within the bedding
13.		—	planes
14.			
15.			

TEXTURES: This thin sections exhibits caotic brecciation that has resulted in maroon-red and red-green blocks occurring in a carbonate-silica matrix

GRAIN SIZE: Various rock blocks average less than 5×10^{-2} mm grains of phyllosilicates, Fe oxides, quartz and feldspar, the matrix ranges from 5×10^{-2} mm to 1-2 mm

ALTERATION: The maroon red blocks exhibit carbonitication within secondary growth nodules, retrograde chlorite-talc and calcite impregnate the areas between the fault blocks.

GENERAL COMMENTS < STRUCTURE > :

APPENDIX NUMBER 6

Work Index Map of Claim Group

1 Map (in back pocket) Plate 90-1
Scale 1:10,000.

APPENDIX NUMBER 7

Magnetic Contour Map of The Plymouth Deposit

1 Map (in back pocket) Plate 90-2
Scale 1:2,400.

APPENDIX NUMBER 8

Trench Sample Plans

2 Plans (in back pocket) Plates 90-3A and 90-3B
Scale 1:600.

APPENDIX NUMBER 9

Surface Geology Of Trenches

2 Plans (in back pocket) Plates 90-4A and 90-4B
Scale 1:600.

APPENDIX NUMBER 10

Detailed Cross Sections Of Plymouth Deposit

3 Plans: Section T-1,T-2 and DDH 87-3 (in back pocket) Plates 90-5A, 90-5B, and 90-5C
Scale 1:600.

APPENDIX NUMBER 11

Non-Interpretative Lithological Units of Surface Geology

1 Map (in back pocket) Plate 90-6
Scale 1:600.

APPENDIX NUMBER 12

Geology of Plymouth Deposit

1 Map (in back pocket) Plate 90-7
Scale 1:2,400.

APPENDIX NUMBER 13

Grade/Length and Area of Influence - Cross-sections

2 Plans - T-1, T-2 (in back pocket) Plate 90-8A and 90-8B
Scale 1:600.

APPENDIX NUMBER 14

Block, Grade/Volume Tonnage Plans Cross-Sections

2 Plans - T-1, T-2 (in back pocket) Plate 90-A and 90-9B
Scale 1:600.

APPENDIX NUMBER 15

Drill Core Logs

5 Logs - 87-1, 87-2, 87-3, 87-4, 87-5.

M.R.R. MARITIME RESOURCE RESEARCH LIMITED
DIAMOND DRILL RECORD

HOLE NO. 87-1 SHEET NO. 1 of 10

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 1 · LENGTH 305 feet (92.97 meters)

LOCATION Trench Section T-1 Plymouth. 6+50N 16+00E

LATITUDE DEPARTURE

ELEVATION 124 m. AMSL. AZIMUTH 140 Deg.Mag. DIP 45 degrees

STARTED June 87 FINISHED July 87

REMARKS

LOGGED BY J.D.PRINCE,B.Sc.

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
0	9.0	Overburden									
9.0	11.5	Heavily shattered, broken core. Rock fragments intermixed with the beginning of blue-grey slates-siltstones.									
11.5	255.2	<u>Blue-Grey Calcareous Slate-Siltstone:</u> Finely laminated to streaky with flattened stringers of calcite and slate-siltstone. Intermittent clasts of calcite. Negligable sulphides through entire unit. (locations of, as stated below). Angle of bedding to axis of core is 57 degrees. Entire unit is fine-grained. 13.0-14.0 - 55 degree bedding angle 14.0-15.0 - 53 degree bedding angle - partially broken and shattered core. 15.0-17.0 - 54 degree bedding angle 17.0-19.0 - 57 degree bedding angle 19.0-20.0 - 60 degree bedding angle - very minor disseminated sulphides at 19.7' mark. 20.0-21.0 - 61 degree bedding angle - partially broken and some lost core. 21.0-23.0 - 62 degree bedding angle 23.0-25.0 - 60 degree bedding angle - minor calcite vein parallel to bedding, boudins are less flattened. 25.0-27.0 - 62 degree bedding angle - similar to above boudins appear more ovoid. (all boudinages are of slate-siltstone or calcite in nature). 27.0-28.0 - 58 degree bedding angle - shows evidence of									

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NAME OF PROPERTY Woodstock PLYMOUTH ORBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 1 SHEET NO. 2 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		folding at 27.7' mark.									
		28.0-29.0 - 58 degreebedding angle - slightly less laminated in appearance, bedding planes are slightly folded or convoluted in some areas.									
		29.0-31.0 - 55 degree bedding angle - larger boudins present, otherwise unchanged.									
		31.0-33.0 - 50 degree bedding angle									
		33.0-35.0 - 50 degree bedding angle									
		35.0-37.0 - 45 degree bedding angle									
		37.0-39.0 - 50 degree bedding angle									
		39.0-39.8 - 50 degree bedding angle									
		39.8-41.0 - 50 degree bedding angle - minor disseminated pyrite.									
		41.0-43.0 - 45 degree bedding angle									
		43.0-44.0 - 46 degree bedding angle									
		44.0-45.0 - 50 degree bedding angle - some minor brecciation, minor iron staining at 44.5' mark.									
		45.0-47.0 - 44 degree bedding angle - very minor pyrite at 45' mark.									
		47.0-49.0 - 48 degree bedding angle									
		49.0-51.0 - 46 degree bedding angle									
		51.0-53.0 - 47 degree bedding angle									
		53.0-55.0 - 46 degree bedding angle									
		55.0-57.0 - 48 degree bedding angle									
		57.0-59.0 - 46 degree bedding angle									
		59.0-61.0 - 44 degree bedding angle									
		61.0-63.0 - 47 degree bedding angle									
		63.0-65.0 - orientation of bedding w.r.t. core axis varies from 30-45 degrees, less laminated and more boudinaged.									
		65.0-67.0 - 44 degree bedding angle - boudinaged bands parallel to bedding in the slate-siltstone.									
		67.0-69.0 - 47 degree bedding angle									
		69.0-71.0 - 45 degree bedding angle - very minor pyrite.									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 1 SHEET NO. 3 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		71.0-73.0 - 45 degree bedding angle - several small calcite veins.									
		73.0-74.0 - 45 degree bedding angle									
		74.0-75.0 - 44 degree bedding angle - 2" calcite vein at 74' mark with sharp contacts with surrounding slate-siltstone.									
		75.0-77.0 - 43 degree bedding angle - slightly convoluted at 75' mark.									
		77.0-79.0 - 45 degree bedding angle									
		79.0-81.0 - 45 degree bedding angle - slightly thicker bedding, 2.5" band at 80.5' mark: light grey siltstone with parallel epidote veins.									
		81.0-83.0 - 45 degree bedding angle									
		83.0-85.0 - 45 degree bedding angle - 2" calcite vein underlying 1.5" broken and brecciated slate-siltstone at 84.2' mark, no sulphides.									
		85.0-87.0 - 45 degree bedding angle - 1" calcite vein parallel to bedding at the 85' mark, very minor pyrite at 85.2' mark.									
		87.0-89.0 - 42 degree bedding angle									
		89.0-91.0 - 45 degree bedding angle - larger boudins, less lamination.									
		91.0-93.0 - 42 degree bedding angle - very minor pyrite at 91' mark.									
		93.0-95.0 - 42 degree bedding angle									
		95.0-97.0 - 42 degree bedding angle - minor calcite bands, some which cut bedding at right angles or near to it.									
		97.0-99.0 - 43 degree bedding angle - slightly more convoluted laminate.									
		99.0-101.0 - 42 degree bedding angle									
		101.0-103.0 - 44 degree bedding angle									
		103.0-105.0 - 44 degree bedding angle									
		105.0-107.0 - 46 degree bedding angle - slightly more convoluted and larger boudins.									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. A7 - 1 SHEET NO. 4 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		107.0-109.0 - 45 degree bedding angle 109.0-111.0 - 45 degree bedding angle 111.0-113.0 - 45 degree bedding angle - 1" calcite vein at 111.5' mark, small calcite vein network at 112.7' mark. 113.0-115.0 - 46 degree bedding angle 115.0-117.0 - 46 degree bedding angle - 1" calcite vein at 116' mark. 117.0-119.0 - 45 degree bedding angle - more convoluted and shallower angle at only 30 degrees at 117' mark. 119.0-121.0 - 45 degree bedding angle 121.0-123.0 - 20 degree bedding angle - more fragmented and broken core. 127.0-129.0 - laminated angle varies around the core from 30-45 degrees. 129.0-131.0 - 45 degree bedding angle 131.0-133.0 - 45 degree bedding angle 133.0-135.0 - 44 degree bedding angle 135.0-137.0 - 45 degree bedding angle - 2" of clear calcite x|s at 135' mark. 137.0-139.0 - 44 degree bedding angle - minor convolutions. 139.0-141.0 - 45 degree bedding angle - 1" calcite vein at 140'. 141.0-143.0 - 45 degree bedding angle -finer laminations 143.0-145.0 - 45 degree bedding angle -minor convolutions 145.0-146.6 - 45 degree bedding angle 146.6-147.0 - 45 degree bedding angle -calcite intermixed with slate-siltstone, broken and fragmented. 147.0-149.0 - 45 degree bedding angle - larger boudins, less lenticular. 149.0-151.0 - 45 degree bedding angle - 1" calcite vein at 149.8' mark, .5" calcite vein in slate-siltstone at 150.3' mark.									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 1 SHEET NO. 5 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		151.0-153.0 - 45 degree bedding angle 153.0-155.0 - 46 degree bedding angle - 3 small (.5cm wide) calcite veins, wavy bands, less regular bands. 155.0-157.0 - 48 degree bedding angle - more competent, less breakage. 157.0-159.0 - 45 degree bedding angle - highly fractured core, more regular banding. 159.0-161.0 - 43 degree bedding angle - small calcite vein at 161.1' mark, more calcite veinlets, small amount of pyrite at 160.2' mark. 161.0-163.0 - 48 degree bedding angle - minor pyrite at 161.1' mark. 163.0-165.0 - 44 degree bedding angle - very minor pyrite at 163.2' mark and 164.5' mark. 165.0-167.0 - 43 degree bedding angle - minor pyrite at 165.9' mark, more and larger boudins. 167.0-169.0 - 45 degree bedding angle - highly carbonatized calcite at 167.1' mark. 169.0-171.0 - 46 degree bedding angle - highly fractured and broken core. 171.0-173.0 - 47 degree bedding angle -very minor pyrite. 173.0-175.0 - 45 degree bedding angle - small calcite vein at 173.3' mark, very minor pyrite at 164' mark. 175.0-177.0 - 42 degree bedding angle 177.0-179.0 - 52 degree bedding angle - very minor pyrite at 178' mark. 179.0-181.0 - 47 degree bedding angle - very minor disseminated pyrite at 179'-179.4' mark. 181.0-183.0 - 45 degree bedding angle 183.0-185.0 - 42 degree bedding angle - small calcite vein at 184.1' mark. (.5cm wide) 185.0-187.0 - 45 degree bedding angle - very minor disseminated pyrite at 185.2' mark, series									

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 1 SHEET NO. 6 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		of small <.3cm calcite veins at 185.3-185.6' mark.									
		187.0-189.0 - 44 degree bedding angle									
		189.0-191.0 - 47 degree bedding angle - highly fractured core.									
		191.0-193.0 - 45 degree bedding angle - highly fractured and broken.									
		193.0-195.0 - 46 degree bedding angle									
		195.0-197.0 - 46 degree bedding angle									
		197.0-199.0 - 47 degree bedding angle									
		199.0-201.0 - 47 degree bedding angle - wider bands of boudinaged beds.									
		201.0-203.0 - 45 degree bedding angle - small calcite veinlets at 202.8' mark.									
		203.0-205.0 - 46 degree bedding angle - minor disseminated pyrite at 204' mark.									
		205.0-207.0 - 45 degree bedding angle - minor pyrite along calcite veinlet at 205.2' mark.									
		207.0-209.0 - 44 degree bedding angle									
		209.0-211.0 - 43 degree bedding angle									
		211.0-213.0 - 45 degree bedding angle - very minor pyrite at 211.6', 211.8' @ 212' mark.									
		213.0-215.0 - 42 degree bedding angle									
		215.0-217.0 - 45 degree bedding angle - has slight (3-4 degrees) variation.									
		217.0-218.0 - 44 degree bedding angle - interbedded to small calcite layers.									
		218.0-219.0 - 42 degree bedding angle									
		219.0-221.0 - 41 degree bedding angle									
		221.0-222.5 - 42 degree bedding angle - highly boudinaged									
		222.5-222.7 - 43 degree bedding angle - 2" wide light grey boudins.									
		222.7-223.0 - 42 degree bedding angle									
		223.0-225.0 - 41 degree bedding angle									
		225.0-227.0 - 45 degree bedding angle									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. A7 - 1 SHEET NO. 7 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		227.0-229.0 - 42 degree bedding angle 229.0-231.0 - 39 degree bedding angle 231.0-233.0 - 40 degree bedding angle 233.0-235.0 - 41 degree bedding angle - no pyrite, very little calcite. 235.0-237.0 - 45 degree bedding angle 237.0-239.0 - 43 degree bedding angle 239.0-241.0 - 42 degree bedding angle 241.0-243.0 - 41 degree bedding angle - highly broken section of core. 243.0-245.0 - 45 degree bedding angle 245.0-247.0 - 43 degree bedding angle - no sulphides or calcite. 247.0-249.0 - fractured core, large calcite boudinage at 248.6' mark, pyrite along bedding at 248.8' mark. 249.0-251.0 - 42 degree bedding angle - core is gradually changing from dark grey to light grey, large 2" calcite clast at 250.6' mark with minor pyrite. 251.0-251.3 - 43 degree bedding angle 251.3-253.0 - 40 degree bedding angle - light grey, boudinaged calcareous slate-siltstone. 253.0-254.3 - 38 degree bedding angle - highly boudinaged light grey slate-siltstone. 254.3-255.2 - 40 degree bedding angle - highly bedded, non-clastic light grey calcareous slate-siltstone 1cm wide, light blue to black, calcareous band at 254.3' mark, this marks contact between boudinage-rich & boudinage-poor core.									
255.2	305.0	Non-Calcareous Red Siltstone: Highly bedded and potassic/silic alteration in localized									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 1 SHEET NO. 8 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		areas, interbedded in this siltstone are bands or layers of maroon-red siltstone, brick-red siltstone also contains interbeds of grey siltstone in localized areas, dominantly towards the top.									
		256.4 - small 3cm wide band of pale maroon-red siltstone.									
		257.0-257.8 - brick-red siltstone.									
		257.8-258.0 - highly potassic/siliceous siltstone with minor grey siltstone boudins.									
		258.0-259.0 - massive red siltstone with stringers of quartz - grey siltstone, largely potassic/ siliceous alteration zone at 258.8' mark.									
		259.0-261.0 - very highly potassic/siliceous altered red siltstone.									
		261.0-262.0 - massive brick-red siltstone.									
		262.0-262.6 - 40 degree bedding angle - minor pale maroon-red siltstone.									
		262.6-263.6 - 38 degree bedding angle - brick-red siltstone with very minor pale maroon-red siltstone.									
		263.6-263.8 - lost core.									
		263.8-264.5 - pale maroon-red siltstone with boudinaged bedding.									
		264.5-264.9 - 40 degree bedding angle - brick-red siltstone.									
		264.9-265.3 - brick-red siltstone interbedded with dark (pale) maroon-red siltstone.									
		265.3-267.0 - brick-red siltstone with very minor maroon-red layers.									
		267.0-267.7 - siltstone interbedded with 4 small maroon-red layers.									
		267.7-269.0 - broken and fractured core of massive brick-red siltstone.									
		269.0-271.0 - massive brick-red siltstone.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 1 SHEET NO 9 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		271.0-273.0 - highly broken core of brick-red siltstone.									
		273.0-274.4 - massive brick-red siltstone.									
		274.4-274.5 - 2 layers of low grade maroon-red siltstone.									
		274.5-275.0 - massive brick-red siltstone.									
		275.0-275.75 - brick-red siltstone interbedded with pale maroon-red siltstone layers.									
		275.75-277.0 - quartz vein at 276.4' mark.									
		277.0-279.0 - 40 degree bedding angle - brick-red siltstone with very minor maroon-red siltstone, no quartz.									
		279.0-281.0 - massive siltstone with interbedding of pale maroon-red siltstone.									
		281.0-281.5 - pale maroon-red siltstone.									
		281.5-283.0 - 45 degree bedding angle - brick-red siltstone.									
		283.0-283.7 - fractured and broken core									
		283.7-283.8 - maroon-red layers with light grey siltstone boudins in brick-red siltstone.									
		283.8-285.0 - 44 degree bedding angle									
		285.0-285.4 - 43 degree bedding angle - brick-red siltstone.									
		285.4-285.6 - pale maroon-red siltstone.									
		285.6-286.0 - brick-red siltstone with minor quartz.									
		286.0-286.4 - quartz rich section.									
		286.4-286.6 - brick-red siltstone.									
		286.6-286.8 - maroon-red siltstone.									
		286.8-287.0 - 3 degree bedding angle - brick-red siltstone interbedded with sericitic/potassically altered boudins, bedding angle to C.A. changes.									
		287.0-287.5 - clastic brick-red siltstone.									
		287.5-288.0 - highly silic/potassic brick-red siltstone.									
		288.0-289.0 - thinly bedded brick-red siltstone with maroon-red siltstone.									
		289.0-291.0 - 3 degree bedding angle.									
		291.0-292.45 - 30 degree bedding angle - brick-red siltstone, thinly bedded.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 1 SHEET NO. 10 of 10

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		292.45-293.0 - dark maroon-red siltstone. 293.0-293.3 - 38 degree bedding angle - brick-red siltstone. 293.3-293.7 - pale maroon-red siltstone. 293.7-294.3 - highly fractured brick-red siltstone, quartz and maroon-red siltstone. 294.3-294.7 - massive quartz with minor mn. at contacts. 294.7-295.0 - 33 degree bedding angle - thin bedded brick-red siltstone. 295.0-295.6 - massive quartz with stringers of siltstone. 295.6-297.0 - thin bedded brick-red siltstone with very minor maroon-red layers and quartz stringers. 297.0-297.7 - 40 degree bedding angle - brick-red siltstone with quartz. 297.7-299.0 - 40 degree bedding angle - brick-red siltstone. 299.0-299.7 - 30 degree bedding angle - dark maroon-red layers are cross-cut by quartz veins. 299.7-300.8 - 38 degree bedding angle - brick-red siltstone. 300.8-301.5 - quartz dominated section, small quartz xls on ends of section. 301.5-303.0 - 30 degree bedding angle - thin bedded brick-red siltstone. 303.0-303.3 - lost core. 303.3-303.9 - maroon-red siltstone. 303.9-305.0 - 25 degree bedding angle - brick-red siltstone. 305' - End of Hole.									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED
DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY (M.I.S.P.)
HOLE NO. 87 - 2 LENGTH 365.5 feet (111.4 meters)
LOCATION Trench Section T-1, Plymouth, 5+00N 16+90E
LATITUDE _____ DEPARTURE _____
ELEVATION 124 m. AMSL AZIMUTH 140 Deg. Mag. DIP 45 degrees
STARTED Sept 15/87 FINISHED Oct 1/87

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

HOLE NO 87-2 SHEET NO. 1 of 21
REMARKS _____
LOGGED BY J.D.PRINCE, B.Sc.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		B.A.=Bedding Angle C.A.=Core Axis									
0'	5'	Overburden									
5'	45'3"	Calcareous Blue-Grey Slate/Siltstone:									
		5'-5'6"- heavily shattered, fragments of rock, beginnings of grey.									
		5'6"-7'- blue-grey calcareous siltstone, finely laminated/streaky quartz, calcite stringers & clasts, B.A. @ 55 degrees to C.A., very fine-grained - highly calcareous.									
		7'-10'- B.A. @ 45 degrees to C.A., shattered core.									
		10'-10'6" - disseminated pyrite - minor at 10'6", B.A. @ 45 degrees to C.A.									
		10'6"-11'- B.A. @ 45 degrees to C.A., sulphide nodules up to 1/10" at 11' with calcite aurioles.									
		11'-13'- B.A. @ 50 degrees to C.A., pyrite present, crystal clusters up to 2/10".									
		13'-13'6"- B.A. @ 50 degrees to C.A., minor calcite vein at 13'6", (1/10").									
		13'6"-16'- B.A. @ 55 degrees to C.A., minor pyrite, evidence of folding, beds pinching out, elongated/altered boudins, shattered core at 14'6".									
		16'-19'- competent grey siltstone, more calcite stringers & boudins evident, evidence of F-S folding,									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 2 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		average B.A. @ 50 degrees to C.A., no pyrite. 19'-22'6"- B.A. @ 54 degrees to C.A. 22'6"-23'- cross-cutting calcite veins. 23'-23'6"-massive pyrite in calcite/siltstone, up to 1" diameter crystal clusters - fluid related. 23'6"-24'- F_1 folding present, very small scale 1/10", B.A. @ 52 degrees to C.A., boudins & stringers of calcite in grey slate, boudins show elongation. 24'-26'- B.A. @ 49 degrees to C.A., minor disseminated pyrite. 26'-27'- calcite stringers show cross-cutting at bedding, interbedded boudins appear less deformed, B.A. @ 52 degrees to C.A., no evident sulphides, calcite vein @ 26'6" up to 3/10" wide - interbedded. 27'-27'6"- shattered & lost core, sulphides evident in shattered core left.									
		27'6"-28'- B.A. @ 49 degrees to C.A., large (2" x 1/2") calcite boudins interbedded, elongated, boudinaged.	87-2-28	28.0	38.0	10.0					
		28'-28'6" - B.A. @ 47 degrees to C.A., minor disseminated sulphides in calcite boudins. 28'6"-29'6"- B.A. @ 53 degrees to C.A., boudins less deformed & larger still. 29'6"-30'6"- B.A. @ 53 degrees to C.A., zone of calcite cross-cutting bedding, up to 1/2" wide blebby veins. 30'6"-35'- B.A. @ 54 degrees to C.A., highly banded & deformed grey siltstone, slightly darker color, evidence of major folding/deformation, possible F_1 type folding @ 33'4", calcite vein @ 33'8" - 1/10". 35'-36'- B.A. @ 56 degrees to C.A., banding still evident but deformation less, very small calcite veins cross-cutting bedding @ 35'6".									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 3 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	TOTAL	%	%	OZ/TON	OZ/TON	
		36'-38'- B.A. @ 54 degrees to C.A., finely laminated grey siltstone with blebs/stringers of calcite abundant, mainly in bedding plane but some cross-cutting. 38'-40'- B.A. @ 52 degrees to C.A. 40'-41'- B.A. @ 54 degrees to C.A. 41'-42'6" - highly deformed - healed breccia? 42'6"-44'6" - B.A. @ 65 degrees to C.A., back into same F_1 laminated siltstone as in 36'-41'. 44'6"-45'3" - large chlorite vein, variable width up to 1'5" cross-cutting strata, several smaller veinlets associated with chlorite vein, no associated sulphides.									
45'3"	50'5"	Grey-Green Finely Bedded Siltstone: Very fine-grained & finely bedded, ie < 1/16", B.A. @ 54 degrees to C.A., thinly laminated, few visible boudins, a few small calcite veinlets, otherwise non-calcareous. 46'-48'- B.A. @ 56 degrees to C.A. 48'-50'5" - B.A. @ 57 degrees to C.A.	87-2-46	46.00	50.42	4.42					
50'5"	183'11"	Interbedded Brick-Red to Maroon-Red Siltstone: B.A. @ 58 degrees to C.A., very finely bedded, ie < 1/16" the typical spacing of maroon-red mn. rich siltstone vs. brick-red hematite siltstone zones range around 1-2' each, manganiferous rich band from 51'6"-53', interbedded manganese bedding. 55'-55'4" - B.A. @ 60 degrees to C.A., interbedded medium grey & brick-red siltstone. 55'4"-56' - B.A. @ 60 degrees to C.A., brick-red siltstone. 56'-60'6" - B.A. @ 70 degrees to C.A., very fine-grained	87-2-50	50.42	76.00	25.58					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 4 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		brick-red siltstone, occasional elongated, boudinaged nodules of green siltstone, non-calcareous clay appearance, individual lithographics generally indistinguishable.									
		58'-60'6" - B.A. @ 75 degrees to C.A.									
		60'6"-61' - B.A. @ 75 degrees to C.A., zone of interbedded boudinaged green siltstone nodules up to 1/20" within maroon-red mn. rich slate.									
		61'-64' - B.A. @ 75 degrees to C.A., fine-grained brick-red siltstone with discontinuous mn. bearing interbeds up to 1/10".									
		64'-66' - B.A. @ 73 degrees to C.A.									
		66'-68' - B.A. @ 66 degrees to C.A.									
		68'-70' - B.A. @ 63 degrees to C.A., veinlets of chlorite cross-cutting red beds @ 55 degrees.									
		70'-72' - B.A. @ 59 degrees to C.A.									
		72'-74' - B.A. @ 60 degrees to C.A.									
		74'-75' - B.A. @ 58 degrees to C.A.									
		75'-75'6" - B.A. @ 59 degrees to C.A., zone of manganese maroon-rich interbeds.									
		75'6"-76'6" - B.A. @ 58 degrees to C.A.	87-2-76	76.00	96.00	20.00					
		76'6"-77' - quartz veins, associated mn. mineralization, shear zone - fracture filled.									
		77'-78' - B.A. @ 56 degrees to C.A.									
		78'-80' - B.A. @ 62 degrees to C.A.									
		80'-81' - manganese interbeds, indistinguishable bed thickness, discontinuous quartz-feldspar nodules, evidence of ducite F_1 folding & boudinage of the bedding, some small veinlets of quartz cross-cutting bedding planes as well, veins range from 5-10 degrees to C.A.									
		81'-82' - B.A. @ 68 degrees to C.A., fine-grained brick-red silttone with occasional interbedded maroon-red siltstone.									
		82'-84' - B.A. @ 66 degrees to C.A.									

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NAME OF PROPERTY Woodstock PLYMOUTH ORE BODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 5 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		84'-86'6" - B.A. @ 66 degrees to C.A.									
		86'6"-88' - B.A. @ 68 degrees to C.A., interbedded maroon-red mn. rich zone with random quartz veinlets both ~11 degrees to C.A. & cross-cutting beds @ 0-20 degrees to C.A.									
		88'-90' - B.A. @ 65 degrees to C.A., brick-red siltstone, occasional small quartz veins ~1/20", & interbedded maroon-red siltstone.									
		90'-92' - B.A. @ 62 degrees to C.A.									
		92'-94' - B.A. @ 62 degrees to C.A.									
		94'-96' - B.A. @ 60 degrees to C.A., small (2") section of core is mud & indicates fault zone at 95'6".	87-2-96	96.00	106.00	10.00					
		96'-98' - B.A. @ 54 degrees to C.A., shearing with quartz filling @ 97'6" - 30 degrees to C.A., shear ~ 75/070.									
		98'-99'- B.A. @ 58 degrees to C.A.									
		99'-99'6" - B.A. @ 55 degrees to C.A., interbedded maroon-red mn. banding, quartz vein - up to 2/10", fracture filling 20 degrees to C.A.									
		99'6"-100'6" - B.A. @ 50 degrees to C.A., brick-red silt stone, finely laminated.									
		100'6"-102'6" - heavy mn. banding - beds parallel to prominent quartz veining 60 degrees to C.A., foliations of F_1 style ducite folding & quartz veins up to 1/2" - subhorizontal, 20 degrees to C.A.									
		102'6"-105'6" - brick-red slate - finely laminated, subhorizontal quartz veining - up to 1/10" thick.									
		105'6"-108'6" - deep purple to black thinly laminated siltstone with interbedded brick-red slates & quartz veins, 60 degrees to C.A., up to 1/10" thick, cross-cutting ~perpendicular quartz veins also prominent up to 1/4", fractures/quartz veins @ 25 degrees cross-	87-2-106	106.00	116.00	10.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH ORE BODY

DIAMOND DRILL RECORD

HOLE NO 87 - 2 SHEET NO 6 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		cut bedding foliation at same cross-cutting angle.									
		107'8"-108'5" - B.A. @ 10 degrees to C.A.,core parallel fold hinge, core of large fold, evidence of minor plastic deformation, small scale folding/boudinage, F_1 style folds fold axis subhorizontal to C.A.									
		108'6"-110'- maroon-red siltstone, quartz srtingers >1/8" parallel to B.A. @ 52 degrees to C.A.,									
		110'-118'6"- brick-red siltstone thinly laminated, 2" maroon-red rich zone at 110'8" with calcite veinlets cross-cutting beds at 50 degrees to C.A., fractures cross-cut each other at 20-30 degrees to C.A.,minor sulphides in calcite veinlets.									
		110'-112'- B.A. @ 48 degrees to C.A.									
		112'-114' - maroon-red mn. rich zones, interbeds, @ 112'2" & 113'3" (1/2"), also some boudins of mn. rich material, some shattered core at 113'-114'.									
		114'-116'- B.A. @ 58 degrees to C.A., broken/shattered core from 115'-116'.	87-2-116	116.00	136.00	20.00					
		116'-118'- B.A. @ 60 degrees to C.A., quartz vein @ 117'9" (1/4").									
		118'-118'6" - B.A. @ 62 degrees to C.A.									
		118'6"-120'5" - maroon-red mn. rich zone, interbedded brick-red siltstone, quartz veins up to 1" cross-cutting @ 0-5 degrees to C.A.									
		118'6"-119'6" - interbedded 1/16" quartz & calcite vein, B.A. @ 80 degrees to C.A., fractures @ 20-30 degrees to C.A. & cross-cut each other. Fe stained discontinuous banding (1/10"), @ 119'7" - heavily fractured, small scale brecciation.									
		120'-120'5" - pseudo-nodules of carbonate are boudinaged.									
		120'5"-122'- B.A. @ 65 degrees to C.A., fine-grained									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 7 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		brick-red siltstone, thinly bedded. 122'-124'- B.A. @ 67 degrees to C.A., maroon-red mn. rich bands. 122'6"-122'8" - 3 bands from 1/10" -3/10" wide with minor quartz. 124'-125' - interbedded brick-red & black slate, heavy F_1 type folding evident, minor quartz veins with sulphides. 124'4"-124'11" - folding present with a 3" wavelength, concentric style of ducite deformation. 125'-126' - B.A. @ 68 degrees to C.A., brick-red siltstone, fine-grained, thin laminate. 126'-126'11" - B.A. @ 66 degrees to C.A. 126'11"-127'4" - quartz veining & interbedded maroon-red mn. rich bands, white boudinaged zones, F_1 style folding evident with a 1" wavelength. 127'4"-130'6" - B.A. @ 67 degrees to C.A., brick-red siltstone, bedding parallel quartz vein > 1/8", @ 128'11", (64-70 degrees to C.A.) 130'6"-133'3" - B.A. @ 80 degrees to C.A., maroon-red siltstone, mn. rich, calcite veinlets perpendicular to B.A. @ 10 degrees to C.A., (up to 3/10"), very minor sulphides in calcite veinlets, movement along calcite filled fractures up to 1/3", angle of fractures to C.A. @ 10 degrees, some minor F_1 type folding with a wavelength of ~1/16". 133'3"-134'- B.A. @ 80 degrees to C.A., brick-red slate, very finely laminated, cross-cutting to beds, quartz filled fractures @ 45 degrees to 10 degrees in opposite orientation, full range 55 degrees. 134'-135'3" - B.A. @ 80 degrees to C.A., interbedded black & maroon-red siltstones, calcite vein cuts									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH ORE BODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 8 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		perpendicular to bedding with a 1/4" width, movement along calcite filled fracture 1/2", angle of fracture-filled fracture is 10 degrees to C.A., minor quartz parallel to B.A., F_1 style folds with a 1/2" wavelength, boudinaged beds.									
		135'3"-135'10" - B.A. @ 80 degrees to C.A., brick-red siltstone.									
		135'10'-136'9" - B.A. @ 80 degrees to C.A., interbedded maroon-red, black & minor brick-red siltstone, minor quartz stringers roughly parallel to B.A., calcite veinlets cross-cutting B.A. (1/10") cross-cut beds @ 40-20 degrees, cross-cut each other, deformation shown by boudinaged pinching of beds & minor F_1 type folding with a 1/4" wavelength.	87-2-136	136.00	146.00	10.00					
		136'9"-137'9" - B.A. @ 85 degrees to C.A., brick-red siltstones, fractures quartz filled @ 35 degrees to C.A., core perpendicular fold hinge.									
		137'9"-140'2" - B.A. @ 80 degrees to C.A., interbedded maroon-red & black, minor brick-red siltstones with quartz & calcite veins cross-cutting B.A. @ 10 degrees to C.A.(2/10"), some quartz also parallel to B.A.									
		140'2"-141'8" - B.A. @ 75 degrees to C.A., brick-red siltstone.									
		141'8"-142'6" - B.A. @ 70 degrees to C.A., interbedded maroon-red & black siltstone with small quartz/calcite veinlets parallel & perpendicular to B.A. @ 141'10" - 1" interbed of potassic/silic light altered siltstone, silicification minor.									
		142'6"-143'3" - B.A. @ 70 degrees to C.A., brick-red									

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NAME OF PROPERTY Woodstock PLYMOUTH ORE BODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 9 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		siltstone, thinly laminated, very fine-grained.									
		143'3"-143'9" - B.A. @ 70 degrees to C.A., interbedded maroon-red & black siltstone with minor calcite & quartz veins, @ 143'6" - 2 1/2" section of potassic/silic tan-brown slate with small veins of mn., mild deformation,									
		143'9"-144'- B.A. @ 45 degrees to C.A., brick-red siltstone.									
		144'-144'7" - B.A. @ 70 degrees to C.A., maroon-red siltstone, plastic deformation, folds have a 1/4" wavelength, quartz infilling parallel to beds.									
		144'7"-144'9" - muddy broken core.									
		144'9"-146'10" - B.A. @ 68 degrees to C.A., interbeds of maroon-red & black siltstone, with cross-cutting very minor veins of quartz - fracture filling fractures @ 40 degrees to C.A., minor pyrite.	87-2-146	146.00	156.00	10.00					
		146'10'-148'7" - B.A. @ 70 degrees to C.A., maroon-red siltstone, minor black interbeds cross-cutting fractures @ 30-45 degrees to C.A., both orientations boudinaged beds, lower conformable contact leached.									
		148'7'-149'1" - brick-red siltstone.									
		149'1"-150'10" - B.A. @ 50 degrees to C.A., maroon-red siltstone, fracture-filled beds, boudinaged pseudo-nodules, minor plastic F_1 folds with a 1/4" wavelength.									
		150'10"-154'8" - brick-red slate, very fine-grained.									
		152'-153' - B.A. @ 30 degrees to C.A., open core fractured @ ~10 degrees to C.A., cross-cut fractures @ 40-45 degrees to C.A., both orientations.									
		153'-154' - maroon-red slate, numerous small sericite veins filled up to 2/10" - discontinuous, some									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 10 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	TOTAL	%	%	OZ/TON	OZ/TON	
		small shears visible.									
		154'8"-155'3" - B.A. @ 40 degrees to C.A., maroon-red siltstone, very odd sericite contained within upper unit, has appearance of a chemical boundary, * thin section, cross-cutting fractures @ 30 degrees to B.A.									
		155'3"-156'6" - potassic/silic altered siltstone, the lower contact is gradational into a lower thick red siltstone unit, large open fractures @ 10 degrees to C.A., odd pale flesh-colored siltstone to light green sericite-quartz zone at lower contact.	87-2-156	156.00	166.00	10.00					
		156'6"-157'10" - brick-red siltstone, B.A. @ 20 degrees to C.A., cross-cut fractures, quartz filled @ 30 degrees to C.A., broken core associated with open fracture, minor slickenslides indicate minor fault									
		157'10"-164'2" - B.A. @ 55 degrees to C.A., maroon-red siltstone intercalated with brick-red siltstone, originally these beds could have been interbedded, however, there is abundant sericite boundaries between the two which suggest chemical transportation of the mn. from mn. rich zones to mn. poor zones & vice-versa, this chemical reprecipitation is overprinting previous brittle ductile deformation, the chemical reprecipitation itself is being over-printed by later fracturing & minor shearing, the latest quartz-filled fractures cross-cutting each other & the B.A. is in a range of 35-45 degrees in both orientations, an earlier foliation cross-cuts the B.A. @ 45 degrees to C.A.									
		160'6"-162' - B.A. @ 65 degrees to C.A.									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 -2 SHEET NO. 11 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		162'-164' - B.A. @ 58 degrees to C.A., 2/10" quartz vein @ 162'7".									
		164'2"-166'3" - B.A. @ 60 degrees to C.A., brick-red siltstone, very ordinary in regard to the above unit, fracture to beds @ 20 degrees to C.A.	87-2-166	166.00	186.00	20.00					
		166'3"-172'2" - B.A. @ 45 degrees to C.A., interbedded maroon-red & brick-red siltstone, the maroon-red & intermediate maroon-brick-red units predominate over the brick-red siltstone.									
		167'3"-167'8" - B.A. @ 0-10 degrees to C.A., quartz-chlorite vein, yellow staining @ 40 degrees to C.A.									
		171'6"-171'9" - B.A. @ 65 degrees to C.A., potassic/silic tan-green altered red siltstone, minor quartz/chlorite.									
		171'7"-172'1" - B.A. @ 68 degrees to C.A., brick-red slate									
		172'1"-173'3" - B.A. @ 65 degrees to C.A., potassic/silic grey siltstone, variably chloritized & seritized I.F.									
		173'3"-176'- B.A. @ 70 degrees to C.A., maroon-red siltstone with minor quartz, chlorite & manganese stringers/laminations.									
		176'-178'11" - B.A. @ 64 degrees to C.A., brick-red siltstone with minor interbedded mn. & quartz veinlets.									
		178'11"-183'11" - B.A. @ 65 degrees to C.A., altered interbedded red & black siltstone, varies in color from light green through dark green based on the abundance of chlorite vs sericite.									
		180'1"-180'8" - quartz veins @ 25 degrees to C.A., contains minor chlorite.									
		182'-183'4" - fractures cross-cut bedding @ 25 degrees to C.A., fractures lie parallel to B.A. @									

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 2 SHEET NO. 12 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	TOTAL	%	%	OZ/TON	OZ/TON	
		30 degrees to C.A.									
183'11"	199'7"	**Highly Altered Seriticized Chloritic Grey-Green Siltstone:**									
		183'4"-185'1"- B.A. @ 45 degrees to C.A., chloritic/ silicic infilling of fractures parallel to the bedding, broken core, parting along chloritical bedding planes, sericite breaking down into green clay.									
		185'1"-187'4"- B.A. @ 45 degrees to C.A., intensely chloritizied & seritizied, parts of the zone are broken up, due to parting along chlorite lined beds.	87-2-186	186.00	194.00	8.00					
		187'4"-189'4"- grey, aplite-like potassic/silic altered zone, 90% silical, 5% angular, grey-black rock frags, 5% sulphides.									
		189'4"-190'11"- B.A. @ 45 degrees to C.A., potassic/silic altered broken core, green-tan in color, > 1% sulphides, 1/10" quartz vein @ 10 degrees to C.A.,									
		190'11"-192'6"- silicification (2" quartz vein @ 45 degrees to C.A.), grey to pink "aplitization",									
		191'1"-191'3"-pink-grey 90% S_1O_2,(feldspar) angular mafic component (rock frags), minor dispersed sulphides > 1%, cross-cutting fractures @ 50 degrees to original bedding.									
		192'6"-195'1"- B.A. @ 50 degrees to C.A., grey-green siltstone, sericitic & chloritic alterations present, sulphides slightly more common, F_1 style folds with a 1" wavelength.	87-2-194	194.00	200.00	6.00					
		195'1"-196'3"- grey to pink aplite, same as 190'11"-192'6".									
		196'3"-199'1"- dark green chloritized siltstone, black siltstone originally, contains minor									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 13 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
		original red beds & red pseudo-nodules, original bedding shown by quartz/chlorite cutting @ 50 degrees to C.A. 198'-199'2"- B.A. @ 46 degrees to C.A., potassic/silic green siltstone, 2" quartz vein @ 198'8", minor sulphides. 199'2"-199'7"- pink to grey aplite, contains quartz/chlorite 1/4" veins @ 30 degrees to C.A., no boxed contacts present, contact parallel to bedding, mafics, angular frags retain original bedding direction.								
199'7"	219'8"	<u>Grey-Green Siltstone With Minor Interbedded Brick-Red Siltstone:</u> Various degrees of seritization/chloritization, chlorite/quartz filled fractures cross-cut bedding as well as cross-cutting other fractures at angles ranging from 0-80 degrees to C.A., slickenslides often parallel to fracture planes. 199'7"-200'- broken core associated with the hard to soft contact. 200'-202'- B.A. @ 45 degrees to C.A., fractures cross-cut @ 45-0 degrees in both orientations. 200'7"-201'2"- localized F_1 style 3" wavelength folds cause the B.A. to range from 45-5 degrees to C.A. 202'-203'- shattered, broken core, chloritized siltstone. 204'-206'- B.A. @ 45 degrees to C.A., seriticized potassic silic green slate, cross-cutting fractures @ 60-50 degrees in opposite directions, very minor sulphides. 207'6"-207'7"- aplite non-baked contacts, discordant lower	87-2-200	200.00	210.00	10.00				

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 14 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		contact faulted, sheared angular metased-imentary frags incorporated into the quartz-feldspar ground mass.									
		207'7"-210'4"- B.A. @ 40 degrees to C.A., highly seritized-chloritized F_1 folded area with a 2-3" wavelength, boudinage of red beds common where not affected by folding, chlorite filled secondary fractures @ 35-45 degrees to C.A., this zone was brecciated after folding/seritization & prior to chloritization.	87-2-210	210.00	220.00	10.00					
		208'-208'11'- shattered lost core.									
		210'4"-210'11"- shattered lost core.									
		210'11"-214'- B.A. @ 75 degrees to C.A., 1/4" quartz vein @ 212'4" - 1" quartz/chlorite vein @ 212'10" @ 10 degrees to C.A., minor sulphides, some small brick-red slate, interbeds from 210'11"-212'.									
		214'-215'- B.A. @ 66 degrees to C.A.									
		215'-217'- B.A. @ 75 degrees to C.A., shattered core, seriticized/chloriticized green siltstone, fractures @ 0-30 degrees to C.A.									
		216'11'-218'- open fault zone, mud return.									
		218'-219'8"- F_1 ductile folds with 1/2-2" wavelengths, B.A. @ 5 degrees to C.A., core parallel fold hinge.									
219'8"	256'8"	<u>Interbedded Grey-Green & Maroon-Red Siltstone:</u> Minor sulphides present in seriticized / chloriticized zones, very fine laminations. 219'-220'- B.A. @ 66 degrees to C.A. 220'-223'- B.A. @ 62 degrees to C.A., more minor sulphides. 223'-224'- shattered core.	87-2-220	220.00	230.00	10.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 15 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		224'-225'- B.A. @ 58 degrees to C.A., chlorite-filled fractures @ 30 degrees to C.A., minor sulphides, (<1%) cross-cutting B.A. 225'-226'- shattered core. 226'-228'- B.A. @ 56 degrees to C.A., becomming less potassic/silic. 228'-229'10" - B.A. @ 55 degrees to C.A., more maroon-red siltstone interbeds. 229'10"-234'- maroon-red siltstone. 230'-231'- B.A. @ 54 degrees to C.A., interbedded maroon-red @ grey slates, fine laminations, 1/4" quartz vein @ 230'7". 231'-232'- B.A. @ 58 degrees to C.A., maroon-red slates (manganiferous), purple, fractures filled with quartz @ 58-45 degrees to C.A., parallel & perpendicular to bedding @ 40-30 degrees to C.A. 232'-234'- B.A. @ 59 degrees to C.A.	87-2-230	230.00	240.00	10.00					
		234'-241'7"- B.A. @ 56 degres to C.A.,- grey-green siltstone, (seritization varies), minor interbedded maroon-red siltstone, very minor sulphides. 236'-238'- more sulphides, especially around broken core (some lost) @ 237'10"-238'. 238'-238'5"- broken lost core. 238'5"-239'- B.A. @ 52 degrees to C.A. 239'-240'- broken lost core. 240'-241'7"- B.A. @ 52 degrees to C.A., some interbedded quartz veins, minor interbedded maroon-red siltstone. 241'7"-248'1"- maroon-red siltstone, altered by sericite along bedding & by quartz-chlorite within fractures, plastic deformations, F_1 style folding present of boudinage. 243'6'-246'- B.A. @ 35 degrees to C.A., interbedded maroon-	87-2-240	240.00	260.00	20.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87-2 SHEET NO. 16 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		red & green-grey slate, quartz veins both parallel (35 degrees to C.A.) & perpendicular to B.A. (40 degrees to C.A.), evidence of shearing & folding @ 245'4"-245'10", mn. bearing beds common.									
		246'-248'1"- B.A. @ 35 degrees to C.A., cross-cutting minor quartz fractures @ 30 degrees to C.A., interbedded grey & maroon-red siltstone, fine laminations, intervals up to 4-6".									
		248'1"-251'8"- B.A. @ 50 degrees to C.A., grey-green siltstone, cross-cutting fractures.									
		251'8"-252'2"- B.A. @ 35 degres to C.A., evenly interbedded green & 2" bands, 3 maroon-red, 2 green, green units contain abundant chlorite, minor sericite.									
		252'2"-253'3"- B.A. @ 30 degrees to C.A., green siltstone, fractures cross-cut @ 60 degrees to C.A.									
		252'3"-254'8"- B.A. @ 30 degres to C.A., interbedded maroon-red siltstone, minor green siltstone fractures, quartz healed cross-cut & parallel @ 10-30 degrees.									
		254'8"-255'8"- B.A. @ 40 degrees to C.A., green siltstone, variously potassic/silic boudinaged beds, fractures cross-cut beds @ 40 degrees to C.A.									
		255'8"-256'8"- B.A. @ 30 degrees to C.A., maroon-red siltstone, fractures cross-cut beds @ 10-30 degrees to C.A.									
		256'8"-258'2"- B.A. @ 40 degrees to C.A., cross-cutting fractures @ 35 degrees to C.A.									
258'2"	324'1"	<u>Interbedded Maroon-Red & Green-Black Siltstones:</u>	87-2-260	260.00	272.00	12.00					
		Maroon-red siltstone with minor bands of black siltstone, B.A. @ 40 degrees to C.A. - 259'6" & 260'6" @ 50 degrees									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 17 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		to C.A. - 262'6" cross-cutting fractures @ 30 degrees to C.A.									
		263'8'-282'11"- Seriticized black to dark green siltstone, pyrite abundant, occurs as disseminated blebs, up to 5% upper contact contains brown to pink siltstone.									
		264'-266'- B.A. @ 40 degrees to C.A.									
		266'-270'- B.A. @ 50 degrees to C.A., 3-4 % minor sulphides (pyrite blebs).									
		270'10"-271'8"- 2 cores of F_1 intrafolic style folds with a 3" wavelength.	87-2-272	272.00	282.00	10.00					
		272'2"- core of an F_1 style fold, wavelength ?									
		273'- B.A. @ 30 degrees to C.A.									
		273'6"- B.A. @ 40 degrees to C.A.									
		274'-274'9"- stylolitic-ducite F_1 style folding with a 1/8" wavelength.									
		275'3"-276'5"- B.A. @ 50 degrees to C.A., interbedded maroon-red @ grey manganiferous slate, 1-2% pyrite.									
		277'- B.A. @ 34 degrees to C.A.									
		279'- B.A. @ 20 degrees to C.A.									
		279'5"- B.A. @ 20 degrees to C.A., chlorite rich band 1" wide.									
		280'6"-282'11"- B.A. @ 54 degrees to C.A., darker grey slate, 1" quartz vein @ 280'2", minor broken core @ 281'-281'3", more quartz (1") @ 281'5".	87-2-282	282.00	292.58	10.58					
		282'11"-288'8"- interbedded maroon-red & green chlorite rich siltstone.									
		283'- B.A. @ 40 degrees to C.A., cross-cutting fractures @ 10-30 degrees to C.A.									
		286'2"- B.A. @ 20 degrees to C.A., cross-cutting fractures @ 20 degrees to C.A.									
		286'2"-288'5"- 3 cores of F_1 style folds with a 5" wavelength, 1% sulphides.									

M.P.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 18 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		288'8"-292'7"- B.A. @ 50 degrees to C.A., green chloritic siltstone with interbedded quartz/calcite veinlets, fractures cross-cutting @ 60 degrees to C.A., pyrite 2-4% as large blebs.									
		288'8"-290'- interbedded maroon-red chloritic slate, pyrite present, fractured core @ 289'4".									
		292'7"-306'- B.A. @ 75 degrees to C.A., maroon-red siltstone with minor interbeds of black siltstone & odd zones of pink & flesh alterations, which reveal minor zones of silicification/ seriticization. Maroon-red slate with minor seritic interbeds (<<< 1/10"), quartz veins cross-cut beds @ 0-50 degrees to C.A.	87-2-292	292.58	306.00	13.42					
		294'-296'- B.A. @ 73 degrees to C.A., minor grey & black interbeds, very, very minor Fe staining.									
		296'-297'8"- B.A. @ 50 degrees to C.A., interbedded maroon red & black siltstones, heavily convoluted, chlorite/quartz filled shear-faulted zone, many angular fragments of red, flesh, black, tan-green meta sediments, minor sulphides.									
		298'-300'- B.A. @ 5 degrees to C.A., red slate with minor black interbeds, convoluted, F_1 style folding minor pyrite, cross-cutting fractures, chlorite/ quartz filled, intersect bedding @ 45-50 degrees in the opposite direction.									
		300'-302'- B.A. @ 40 degrees to C.A., minor core shattering @ 300'6" (2"), minor grey interbeds & pyrite.									
		302'-304'- B.A. @ 25 degrees to C.A., maroon-red siltstone, fracture filling quartz/chlorite/calcite veins up to 1" wide very common, minor pyrite, @ 303' shearing/folding, monoclines very predominant.									
		304'-306'- B.A. @67 degrees to C.A., fracture filling quartz/calcite veins end @ 305', Mn. rich @ 306', before turning into potassic/silic green									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87- 2 SHEET NO. 19 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		slate, minor pyrite. 306'-320'2"- B.A. @ 60 degrres to C.A., potassic/silic altered light tan-green red siltstone, boudinage pseudo-nodules of maroon-red siltstone common also, 3-5% sulphides, chlorite/quartz vein @ 306'4" within a breccia zone @ 10 degrees to C.A. 308'-310'- B.A. @ 50 degrees to C.A., minor quartz veining & sulphides present. 310'-312'- B.A. @ 50 degrres to C.A., some broken core @ 311'6" (3"). 312'-316'8"- B.A. @ 40-50 degrees to C.A., 2" quartz vein @ 315'2", more sulphides, 1/2" quartz vein @ 316', @ 312'10" - F_1 fold core. 317'2"-318'2"- interbedded maroon-red siltstone & quartz veining. 318'2"-320'2"- B.A. @ 40 degrees to C.A., broken/sheared core, interbedded maroon-red & black seriticized siltstone, chlorite - polished fracture surfaces parallel to bedding. 320'2"-321'4"- dark green to black chloritized siltstone, shattered core. 321'4"-324'1"- B.A. @ 30 degrees to C.A., interbedded seriticized maroon-red siltstone, pyrite - lots, shearing offsets common @ 50-60 degrees to C.A. cross-cut bedding. 323'-324'- broken core	87-2-306	306.00	324.00	18.00					
324'1"	340'3"	<u>Dark Green-Black Siltstone:</u> Commonly chlorite lines the bedding planes, sericitic alteration changes the color to tan-green, which is due mainly to alterations at maroon-red & black siltstone by potassic/silic alteration differences due to bulk chemical	87-2-324	324.00	334.00	10.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 20 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		differences of the two lithologies, contains 1-2% pyrite, chalcopyrite. 316'-326'- N.B. lithographies in zone tend to be sharp divisions with no apparent gradation, (except broken core), suspect major shear zone with gault controlled lithographies. 326'-328'- black/green chloritic slate 326'4"- B.A. @ 80 degrees to C.A., core of F_1 style fold. 327'8"- B.A. @ 70 degrees to C.A., core of F_1 style fold. 328'-330'- B.A. @ 72 degrees to C.A., very fine-grained, deformed (convoluted), 329'7" - core of F_1 style fold. 330'-332'- B.A. @ 60 degrees to C.A., broken core (2") @ 331'10", polished fracture surfaces. 332'-334'- B.A. @ 55 degrees to C.A.. potassic/silic alteration of green-black siltstone, so that the color is green-tan, fractures cross-cut B.A. @ 30 degrees to C.A. 334'-336'- B.A. @ 45 degrees to C.A., slickenslides on shear surfaces, @ 335'8" - core of F_1 fold. 336'-340'3"- B.A. @ 55 degrees to C.A., bedding variable in dip (reverses often), 3" shattered core @ 336'6'-336'9", 1/4" quartz vein @ 337'1", (parallel fractures), @ 336'2"-337'11" a series of F_1 folds, wavelength 1". 338'-340'- shattered core from 338'8'-339'2".	87-2-334	334.00	344.00	10.00				
340'3"	356'8"	<u>Interbedded Green-Black Siltstone With Minor Maroon-Red Siltstone:</u> B.A. @ 65 degrees to C.A., 1-2% disseminated pyrite-chalcopyrite, 2" of broken core @ 341', & 4" @ 342', minor sulphides.									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 2 SHEET NO. 21 of 21

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		342'-344'- B.A. @ 65 degrees to C.A., broken core (4") @ 344', chlorite/quartz filled fractures, cross-cutting & parallel @ 25 degrees to C.A. 344'-346'- B.A. @ 58 degrees to C.A., discontinuous (boud-inaged) red slates, minor pyrite, 1/4" quartz vein @ 344'10" (@ 35 degrees). 346'-348'- B.A. @ 50 degrees to C.A., some rare interbedded red slate, 1/2" quartz vein @ 346'4". 348'-350'- B.A. @ 47 degrees to C.A. 350'-351'- B.A. @ 56 degrees to C.A. 351'-352'- broken core. 352'-354'- B.A. @ 60 degrees to C.A., fractures cross-cut beds @ 35 degrees to C.A., very minor pyrite. 354'-355'10"- B.A. @ 57 degrees to C.A., broken core, minor pyrite/quartz, 2" (2 pieces) of light green slate @ 355', probably fell from above in column.	87-2-344	344.00	356.75	12.75					
356'8"	365'6"	<u>Maroon-Red Siltstone - (Manganiferous):</u> Minor interbedded green-black slates/quartz, very minor pyrite > 1%, quartz veins @ 5 degrees to C.A., 1/2" quartz vein perpendicular to bed @ 356'8". 358'-360'- B.A. @ 60 degrees to C.A., interbedded grey-green siltstone & minor maroon-red siltstone, minor pyrite. 360'-362'- B.A. @ 60 degrees to C.A. 362'-364'- B.A. @ 51 degrees to C.A., quartz fractures filling (1/4") @ 363'4". 364'-365'6"- broken/shattered core, fracture evidence, polished shear surfaces. 365'6" - End Of Hole	87-2-356	356.75	365.50	8.75					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED
DIAMOND DRILL RECORD

HOLE NO. 87-3 SHEET NO. 1 of 25

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY (M.I.S.P.)
HOLE NO. 87 - 3 LENGTH 635 feet (193.5 m.)
LOCATION Trench Section T-1 Plymouth 3+80N 17+50E
LATITUDE DEPARTURE
ELEVATION 124 m. A.M.S.L. AZIMUTH 118 Deg. Mag DIP 45 degrees
STARTED Sept 30/87 FINISHED Oct 31/87

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

REMARKS

LOGGED BY J.D. PRINCE, B.Sc.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		B.A. = Bedding Angle C.A. = Core Axis									
0	20'	Overburden									
20'	92'	Highly Altered Interbedded Maroon-Red & Grey-Green Slate:									
20'	36'3"	First box of core - 2' of core loss. Potassic/silic altered siltstone - variable in color, color ranges from tan-grey in highly altered sections, remanent coloring suggests bands (beds) of interbedded red grey siltstone - the matrix of the unit is very fine-grained & the identification of the original minerals is difficult - the unit is very highly convoluted and plastically folded & contains pseudo-nodules of boudin-aged bedding - the nodules can be red, grey or black & often are quite reduced chemically - B.A. is from 10-40 degrees to the C.A. - cross-cutting fracture cleavage occurs @ 40 degrees to the C.A. - mineralization - disseminated py, possibly aspy; sulphides contained within the tan-grey leached sections.	87-3-20	20.00	32.00	12.00					
			87-3-32	32.00	42.00	10.00					
36'3"	69'9"	Siltstone - variable in color, color ranges from dark (chloritic) green, molted green-red, to light to dark grey - the original units appear to be interbedded grey									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 2 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		siltstone with thick zones of red siltstone to slate - the degree of leaching appears to be less pronounced than the unit above, which before alterations contained the same lithologies - in addition, the degree of silicification & minor quartz has increased - dark green chlorite appears to have come in along fractures which are parallel to the original bedding - ducite deformation evident from boudinage of various beds into pseudo-nodules. 36'3"-52' - B.A. @ 32-40 degrees to the C.A. 47'10" - 1/2" barren quartz vein. 52'3"-54'10" - zone of healed fractures & chloritization 59'6"-60'6"- B.A. @ 35 degrees to the C.A. - @ 40 degrees tension gashes in sub-parallel to B.A. 58'3"-59'8" - light green leached zone, increased silicification.	87-3-42	42.00	62.00	20.00					
		64'4" - 3" assymetrical fold. 67' - contact based on chemistry-alteration, conformable & B.A. runs @ 50 degrees to the C.A.	87-3-62	62.00	82.00	20.00					
69'9"	92'	Light olive to tan-green siltstone - color can range from tan-green to grey based on the intensity of alteration, & the minor chemical differences of the original beds - this sub-division is more heavily potassic/silic & sericitized than sub-unit 36'3"-69'9", secondary chlorite occurs within healed fractures & within tension gashes which overprint previous boudinaged bedding - minor nodular K-feldspar boudin structures occur in this sub-zone parallel to bedding & appear to be replacing boudinaged siltstone beds - less than 1% pyrite for overall sub-unit. 69'9"-72' - 40-50 degree B.A. to the C.A. 71'9" - cross-cutting fractures @ 45 degrees to the C.A., second series of fractures sub-parallel to bedding @ 45 degrees to the C.A.	87-3-82	82.00	92.00	10.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 3 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		70'8"-71'5" - zone of intense tan-grey-red alteration, associated with tension gashes filled with chlorite, quartz & orthoclase feldspar - tension gashes run from 0-90 degrees to the C.A. 74'4"-74'8" - zone of intense tan alteration, tension gashing - gash filled by secondary quartz, K-feldspar & chlorite. 78'4"-78'7" - same as 74'4"-78'8" - B.A. @ 45 degrees to the C.A. 80'4"-80'7"- zone of potassic/silic leachings, B.A. @ 35 degrees to the C.A. - f.g. disseminated pyrite. 81' - appears to be more of a red siltstone than a grey siltstone. 82'-83'1" - zone of fracturing with secondary quartz & chlorite. 83'6" - B.A. @ 40 degrees to the C.A. 87'2" - small 1" brecciated zone containing chlorite, quartz, & sericite occurs @ 15 degrees to C.A., B.A. @ 40 degrees to C.A. is overprinted by this breccia. 92' - contact conformable to next unit contact @ 42 degrees B.A. to the C.A.									
92'	127'	<u>Interbedded Maroon-Red and Black Siltstone:</u> This unit contains a slatey siltstone with bands of brick-red siltstone, minor bands of potassic/silic alteration, does not exceed 5" sections within this unit. This siltstone mechanically is more competent & less plastically deformed than the major overlying sericite/ silicous unit. Mineralization - All secondary Fe-sulphides are closely associated to the altered sections of this unit.	87-3-92	92.00	102.00	10.00					
92'	112'	Maroon-red siltstone -									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 4 of 23

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		92'1"-92'5" - a zone of chlorite/plagioclase filled healed breccia. 93' - B.A. lies @ 35 degrees to C.A., also a series of brecciated zones run @ 03 degrees to C.A. 92'-95' - the bedded section has been strongly boudinaged. 94' - a zone centered around this area contains four assymetrical folds that have a wavelength, from limb to limb, of 3". This folded section has been fractured & healed with quartz after this phase of folding occurred. 96'2" - B.A. @ 40 degrees to C.A. 97'4" - a 1" quartz vein cross-cuts the B.A. @ 40 degrees. 98'6" - B.A. lies @ 38 degrees to C.A. with cross-cutting fractures occurring @ 26 degrees to C.A. 100'6" - B.A. lies @ 38 degrees to C.A. & the fractures cross-cut @ 40 degrees to C.A. 101'4" - B.A. lies @ 38 degrees to C.A. & a series of quartz tension gashes cross-cut the bedding & occur @ 10 degrees to C.A.									
		100'10"-103'6" - a zone of potassic/chloritic alteration of red siltstone occurs. 102'6" - B.A. lies @ 40 degrees to C.A. & fractures cross-cut the beds @ 30 degrees to C.A. 104'7"-105'9" - a zone of potassic alteration & tan-brown discoloration occurs, B.A. lies @ 30 degrees to C.A., 2 sets of fractures occur, one cross-cutting the B.A. @ 30 degrees to C.A., the other sub-parallel to B.A. @ 30 degrees to C.A. 106'8"-107'9" - another zone of potassic/silic alteration occurs, which is a tan-brown color, the B.A. lies @ 35 degrees to C.A., a cross-cutting fracture set lies @ 40 degrees to C.A. & a bedding parallel fracture set lies @ 20 degrees to C.A. 110'-110'10" - a zone of chlorite healed breccia & secondary pyrite occurs, B.A. lies @ 30 degrees to C.A. in the un-breccian sections of this zone. A cross-cutting	87-3-102	102.00	112.00	10.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 3 SHEET NO. 5 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
		fracture set lies @ 35 degrees to C.A. 112' - contact conformable to B.A. @ 40 degrees to C.A., gradational contact.								
112'	114'7"	Green-black siltstone - this sub-unit is predominantly filled with secondary chlorite. The protolith cannot be determined in this zone, this sub-unit averages 1% disseminated pyrite. 114'7" - B.A. occurs @ 45 degrees to C.A., fracture cleavage cross-cuts the B.A. @ 18 degrees to C.A.	87-3-112	112.00	127.00	15.00				
114'7"	119'4"	Maroon-red siltstone - same as previous section 92'-112'. 118'6" - B.A. @ 42 degrees to C.A., the lower contact is conformable.								
119'4"	121'8"	Black siltstone - same as previous section 112'-114'7". B.A. ranges from 30-35 degrees to C.A. Overall this altered zone contains < 1% pyrite, black unit is less competent than iron formation. 119'4"-119'10" - small fault occurs which is plated with chlorite lies @ 10 degrees to C.A. 121'8" - gradational contact into underlying iron formation, conformable contact.								
121'8"	127'	Maroon-red Mn. rich zone - the effects of either potassic/silic or chloritic alteration are not evident, the sulphide content is much < 1% pyrite, B.A. occurs @ 38 degrees to C.A. & a cross-cutting fracture set lies @ 15 degrees to C.A., contact sharp but conformable @ 70 degrees to C.A.								
127'	129'1"	<u>Grey-Green Siltstone:</u> The B.A. lies @ 70 degrees to C.A. with a cross-cutting fracture set lying @ 25 degrees to C.A. This unit	87-3-127	127.00	129.08	2.08				

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 6 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		contains < 1% pyrite. 129'1" - the lower contact is conformable but potassic/sericite alteration occurs.									
129'1"	174'2"	<u>Interbedded Maroon-Red to Brick-Red Siltstone:</u>									
129'1"	142'3"	Altered siltstone - within this unit potassic/silic alteration is excessive & secondary color changes range from light green to tan-green. The pyrite content approaches 5% within these alteration zones which have been plastically & brittlely deformed during @ after thé main phases of metamorphism. 129'4"-129'6" - potassic/silic altered zone, B.A. lies @ 75 degrees to C.A., quartz healed fracture cleavage @ two angles: 25 degrees & 60 degrees to C.A., both of which cross-cut the bedding. 131'2"-131'6" - tan potassic/silic alteration, B.A. lies @ 80 degrees to C.A., fracture cleavage @ 50 degrees to C.A 131' - B.A. @ 85 degrees to C.A., core perpendicular fold hinge. 131'4"-131'5" - one shear zone infilled with chlorite & quartz. 132'2"-134'11" - tan-maroon potassic/silic alteration zone containing secondary pyrite, B.A. @ ~28 degrees to C.A., fracture cleavage cross-cuts @ 40 degrees to C.A., toward the lower contact around 134'6", the beds are @ 58 degrees to C.A., the lower contact contains potassium feldspar. 137' - B.A. lies @ 25 degrees to C.A. 139'6" - B.A. lies @ 10 degrees to C.A. * note: @ 137'6"-137'7" - a thin bed of black siltstone lies conformably within the red siltstone, another zone occurs @ 136'6"-137'3"; these zones however are either	87-3-129	129.08	142.00	13.92					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 7 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
		structured lenses or alteration products, as beds can be traced, which change color from red into black along bedding. 140'6" - B.A. @ 20 degrees to C.A., fracture cleavage cross-cuts B.A. @ 40 degrees to C.A. 141'11" - a zone of plastic deformational folding occurs.								
142'3"	146'4"	Zone of alteration - this potassic/silic alteration is over printing black siltstone. Color ranges from tan-brown to olive-green, abundant sericite & 3% pyrite, zones of plastic deformation contain 1/4" wavelength ducite folds, B.A. lies @ 30 degrees to C.A., the alteration is gradational into the next zone, the contact area B.A. is structurally continuous into the next zone & nodular remains of red beds occur within the sericite.	87-3-142	142.00	152.00	10.00				
146'4"	147'6"	Maroon-red siltstone - containing abundant plastic folds (drag-folds?) within a shear zone. 146'4"-147' - randomly oriented folding resulting in no dominant orientation to the beds. 147'-147'6" - B.A. ranges from 50-80 degrees to C.A., brecciation overprints the folding event as indicated by healed shears containing quartz, sericite, chlorite, epidote? & pyrite. The lower contact is oriented @ 50 degrees to C.A. & the bedding is structurally continuous into the next zone.								
147'6"	148'6"	Interbedded maroon-red & black siltstone - contains abundant secondary chlorite & sericite within the rock mass & quartz within brecciated zones, B.A. ranges from 50-60 degrees to C.A., this B.A. is structurally continuous into the next zone.								
148'6"	149'4"	Red siltstone - B.A. occurs @ 60 degrees to C.A. which is cut by quartz vein @ 2 degrees to C.A., contains								

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 8 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		brecciated zones infilled by chlorite & quartz. This zone contains ~5% disseminated pyrite, B.A. is structurally continuous into the next zone.									
149'4"	150'6"	Light olive-green potassic/silic alteration - B.A. lies @ 50 degrees to C.A., the brecciation follows bedding planes in sections & has been healed with quartz, chlorite & pyrite (1-2%), this bedding is disrupted & not continuous into the next zone, indicating brittle disruption (shearing).									
150'6"	151'7"	Interbedded? maroon-red & grey siltstone - B.A. @ 75 degrees to C.A., brecciation of bedding does not disturb the general bedding direction, the siltstone has been healed by quartz, chlorite, sericite & 1-2% pyrite.									
151'7"	155'9"	Chloritically altered red siltstone - B.A. occurs @ 60-85 degrees to C.A., fracture cleavage cross-cuts B.A. & occurs @ 30 degrees to C.A., brecciation overprints the fracture cleavage parallel to the cleavage & is healed by quartz, chlorite & 1% pyrite, B.A. is structurally continuous into the next zone, core perpendicular fold hinge.	87-3-152	152.00	169.92	17.92					
155'9"	157'8"	Black siltstone - B.A. occurs @ 25 degrees to C.A., intensive potassic/silic alteration varies the color from green-black chlorite rich "unaltered zones" to tan-brown to olive-green with sericitic rich areas, the B.A. is structurally continuous into the next zone.									
157'8"	158'9"	Maroon-red siltstone - B.A. occurs in a range from 40-50 degrees to C.A., quartz filled fractures cross-cut B.A. & occur within a range from 0-40 degrees to C.A., the B.A. is structurally continuous into the next zone.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 9 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
158'9"	159'7"	Chloritically altered red siltstone - B.A. @ 50 degrees to C.A., the B.A. is structurally continuous into the next zone.								
159'7"	162'7"	Maroon-red siltstone - 160'6" - B.A. @ 45 degrees to C.A., fracture cleavage cross-cuts the bedding @ occurs @ 25 degrees to C.A. 161'-161'3" - an alteration zone occurs, which is infilled with quartz & chlorite, B.A. is structurally continuous into the next zone.								
162'7"	168'3"	Maroon-red siltstone - this unit has undergone brecciation & healing by quartz & chlorite & blebs of pyrite, very fine-grained pyrite has also replaced beds & individual grains of hematite/magnetite, the total amount of pyrite is~4%, B.A. oriented @ 20 degrees to C.A., B.A. is brecciated, however, the general trend is 20 degrees to C.A. 166'2"-167'10" - a 1" thick quartz vein occurs @ 2-3 degrees to C.A., the lower contact is brecciated & the B.A. is not structurally continuous.								
168'3"	169'11"	Brecciated green to black siltstone - this unit contains nodules of red siltstone, B.A. occurs 60 degrees to C.A., a sheared zone, healed with quartz & chlorite, occurs @ 10 degrees to C.A., B.A. is structurally continuous into the next zone.								
169'11"	174'2"	Interbedded brick-red & maroon-red siltstone- B.A. @ 60-70 degrees to C.A., fracture cleavage cross-cuts the bedding & is oriented @ 20 degrees to C.A., the B.A. is structurally continuous into the next zone. 174'-174'2" - zone is altered to slightly grey by potassic/silic alteration.	87-3-169	169.92	174.17	4.25				

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 10 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
174'2"	422'6"	<u>Interbedded Maroon-Red & Black Siltstone With Minor Green-Black siltstone:</u> The alteration does not seem to have a consistent pattern ie, both the red & black siltstones can be seen to be chloritically & potassic/silic altered, however, the potassic/silic alteration does seem to overprint the chloritic alterations, mechanically, the red siltstone shows the effects of ducite deformation to a greater extent, however, both siltstones exhibit strong structural folding. In general, both alteration types overprint the previous structured deformation by tectonic folding, ducite folding & brittle deformation. Late stage fracturing overprints the alteration & these fractures align parallel to the bedding, these fractures are healed by combinations of quartz, chlorite, & secondary pyrite, (1-2% average). Overall, this unit contains a greater amount of secondary sulphides within the zone 248'7"-422'1", than along the section of core from 92'-248'7", which has not been altered to the extent of the section of core below 248'7".	87-3-174	174.17	182.00	7.83				
174'2"	174'5"	Maroon-red siltstone - B.A. @ 70 degrees to C.A., B.A. is structurally continuous into next zone.								
174'5"	174'8"	Green-black siltstone - B.A. is structurally continuous into next zone.								
174'8"	174'11"	Maroon-red Fe siltstone - ductile deformation evident by local folding of the beds, B.A. running @ 70 degrees to C.A., B.A. is structurally continuous into next zone.								
174'11"	175'9"	Green-black siltstone - B.A. @ 70 degrees to C.A., B.A. has a slatey cleavage, B.A. is structurally continuous								

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH ORE BODY

HOLE NO. 87 - 3 SHEET NO. 11 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		into the next zone.									
175'9"	176'2"	Maroon-red siltstone - B.A. @ 50 degrees to C.A.									
176'2"	176'8"	Zone of green-black siltstone - B.A. @ 80 degrees to C.A., B.A. has a slatey cleavage.									
176'8"	178'2"	Maroon-red siltstone - B.A. @ 50-60 degrees to C.A.									
178'2"	178'9"	Green-black siltstone - chlorite healed fracture cleavage cross-cuts B.A. & is oriented @ 30-40 degrees to C.A., B.A. @ 50 degrees to C.A., B.A. is structurally continuous into next zone.									
178'9"	211'6"	Maroon-red siltstone - 178'10"-179'5" - potassic/silic alteration, grey-green in color, B.A. @ 50 degrees to C.A., fracture cleavage occurs @ 20 degrees to C.A. & cross-cuts the bedding.									
		182'9"-189'10" - potassic/silic alteration of red & black siltstone, the unit is now grey in color, B.A. @ 50 degrees to C.A., fracture cleavage cross-cuts the bedding & occurs @ 30 degrees to C.A.	87-3-182	182.00	192.00	10.00					
		190'2"-190'3" - small white quartz vein occurs @ 40 degrees to C.A. which is parallel to the B.A.									
		190'2"-192'10" - potassic/silic alteration of black siltstone, B.A. @ 26 degrees to C.A. & fracture cleavage which cross-cuts the B.A. @ 30 degrees to C.A.	87-3-192	192.00	212.00	20.00					
		193'4"-193'8" - tan-grey alteration zone, B.A. occurs 30 degrees to C.A.									
		193'10"-194'4" - a small assymetrical fold occurs with a wavelength of 2".									
		197' - B.A. @ 8 degrees to C.A., fracture cleavage cross-cuts B.A. @ 30 degrees to C.A., core parallel fold hinge.									
		200'4"-200'7" - potassic/silic alteration of red siltstone.									
		201'2"-201'5" - potassic/silic alteration of interbeds of									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 12 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
		201'2"-201'5" - potassic/silic alteration of interbeds of red & black siltstone tan-brown color, B.A. @ 40 degrees to C.A. 201'8"-202'11" - tectonic fold with 3" wavelength, (not visible beyond 202'11"), @ 202'11" a 1/4" wavelength. 202'6"-203'4" - brecciated zone @ 10 degrees to C.A., healed with chlorite & quartz. 203'6" - cross-cutting fracture cleavage @ 20-30 degrees to the B.A. occurs @ 45 degrees to the C.A. 205'6"-206'7" - leaching & brecciation, B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage occurs @ 15-25 degrees to the C.A. 206'1"-206'4" - small kink folding of the earliest foliation (bedding) have a wavelength of 1/4", fold axis parallel to C.A. 208'5" - B.A. @ 15 degrees to the C.A., cross-cutting fracture cleavage @ 45 degrees to the C.A. 209'4"-211'3" - a zone of heavy potassic/silic alteration, zones are grey to grey-green, brecciations are associated with the alteration & has been healed by quartz, chlorite & calcite; B.A. is @ 65 degrees to the C.A., cross-cutting fracture cleavage occurs @ 30 degrees to C.A., tension cracks range from 0-30 degrees to the C.A., chloritization is more prominent from 210'5"-211', the B.A. is structurally continuous into the next zone.								
211'6"	212'	Green-black very fine-grained siltstone - B.A. @ 60 degrees to the C.A., thin zone of carbonate parallel to the B.A., thin interbed of iron formation, conformable contacts.								
212'	212'9"	Iron formation - red, very fine-grained, bands of black chlorite, conformable; B.A. @ 63 degrees to the C.A., conformable contacts into the next zone.	87-3-212	212.00	232.00	20.00				
212'9"	213'5"	Green-black very fine-grained siltstone - B.A. @ 55 degrees								

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 3 SHEET NO. 12 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
213'5"	214'3"	Red siltstone - very fine-grained, B.A. @ 50 degrees to the C.A., slickenslides occur parallel to the B.A.								
214'3"	215'1"	Zone of finely interbedded green & red siltstone - carbonate & potassic alteration, secondary boudinaged nodules are present, conformable contacts into next zone.								
215'1"	218'4"	Red to maroon-red iron formation - zone of tan leaching @ 216'5"-216'9", B.A. @ 65 degrees to the C.A., carbonate tension gashes occur @ 0-35 degrees to the C.A., carbonate in bedding planes, pyrite < 1%.								
218'4"	220'2"	Green-black siltstone - very fine-grained, sericite, chlorite, waxy bedding planes, brecciation, healed by quartz, carbonate, incompetent bedding planes, B.A. @ 42 degrees to the C.A.								
220'2"	224'4"	Red to maroon-red iron formation - very fine-grained, ducite zones, brittle fracture zone, quartz-chlorite vein @ 0 degrees to the C.A. 220'2"-220'9" - light green leached zone, conformable to beds. 220'9"-221'2" - pseudo nodules of remanant bedding present, B.A. @ 56 degrees to the C.A., cross-cutting fracture cleavage occurs @ 15 degrees to the C.A., fracturing & tension gashes are also parallel to the B.A., both types of fractures are filled with quartz, chlorite & carbonate. 222'2"-222'4" - small scale F_1 folds occur, which are enhanced by secondary carbonate, these folds have a 1/2" wavelength. 222'7"-223'3" - tension gash, quartz-chlorite filled @ 20-25 degrees to the C.A.								
224'4"	224'9"	Potassic/silic altered red siltstone - very fine-grained,								

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 3 SHEET NO. 14 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		F_2 style folds within dip plane of the beds, 1/4" scale, carbonate pseudo nodules surrounded by red mineral films, B.A. @ 50 degrees to the C.A., fracture cleavage is @ 0-20 degrees to the C.A.									
225'3"	225'6"	Green-black siltstone - very fine-grained, B.A. @ 60 degrees to the C.A.									
225'6"	225'11"	Maroon-red siltstone - B.A. @ 60 degrees to the C.A.									
225'11"	226'10"	Light green siltstone - very fine-grained, pseudo nodules of carbonate occur parallel to B.A., composed of secondary sericite & chlorite, B.A. is @ 55 degrees to the C.A.									
226'10"	227'1"	Maroon-red siltstone - structurally continuous bedding.									
227'1"	228'3"	Green to black siltstone - chlorite rich, structurally continuous bedding.									
228'2"	228'3"	Maroon-red siltstone.									
228'3"	228'6"	Green-black siltstone - containing abundant chlorite.									
228'6"	229'1"	Maroon-red siltstone.									
229'1"	229'7"	Red to black interbedded siltstone - B.A. @ 60 degrees to the C.A.									
229'7"	232'4"	Maroon-red siltstone - very fine-grained, contains zones of alteration conformable to B.A., colors range to pale pink-grey, B.A. is @ 55 degrees to the C.A., carbonate infills parallel to beds, fracture cleavage cross-cuts B.A. 50 degrees to the C.A., minor plastic deformation & boudinage of the B.A.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 15 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
232'4"	232'6"	Grey-green siltstone - fine-grained, quartz, chlorite & biotite/amphibole make up the ground mass, secondary potassic overprinting, mostly feldspar & quartz @ 100 times power, very fine-grained sulphides/Au? within the matrix, not visible to the naked eye, > 1mm grains present, upper & lower contacts conformable within the siltstone.	87-3-232	232.00	242.00	10.00					
232'6"	235'9"	Red to maroon siltstone - this zone is variably altered to tan-brown, tan-green colored. 234'11" - ducite deformation folding at an alteration zone, B.A. @ 50 degrees to the C.A., cross-cutting quartz healed fracture cleavage @ 20 degrees to the C.A., shearing occurs within the bedding planes, carbonate infills these fractures, also boudinaged nodular bedding is present.									
235'9"	238'9"	Green-black siltstone with minor interbeds of maroon-red siltstone, this unit is chloritized & can range from green to green-black. 236'6"-237'3" - contains 3 major interbeds of red siltstone. 237'9"-237'10" - 1" milky white quartz vein, which is bounded by vein walls of chlorite & carbonate. 237'4"-238' - brecciation zone occurs, healed with rhodocrosite, quartz & chlorite, B.A. @ 65 degrees to the C.A., structurally conformable upper & lower contacts.									
238'9"	248'7"	Altered interbedded red & green-black siltstone - B.A. lies @ 70-80 degrees to the C.A. 244'8"-245'6" - green reduced zone, primary?, contains carbonate nodules. 245'6"-248'7" - pyrite blebs begin to occur in core in association with secondary chlorite as fracture fillings. 246'5"-248'3" - green zone, extensive chlorite & pyrite, (247'6"-247'11"), B.A. structurally continuous into next	87-3-242	242.00	262.00	20.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 16 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		zone.									
248'7"	281'5"	Potassic/silic alteration of red siltstone - color ranges from red-green, tan-green to green-black, based on the amount of chlorite or sericite alteration, B.A. @ 50 degrees to the C.A., typical thickness of beds is 1/4", separated by 1/4"-2" alteration sequences. Boudinaged pseudo-nodular red beds are common within the altered areas, these nodules are parallel to the B.A. 238'9"-249'4" - potassic/silic alteration & boudinaged pseudo-nodules. 249'5"-250'10" - zone of brecciation which is healed by chlorite & quartz, fractures run from 0-35 degrees to the C.A. in a cross-cutting pattern. 251'5"-252'6" - zone of brecciation which is healed by chlorite & minor quartz, these fractures align in a pattern @ 20 degrees to the C.A. 252'6"-253'2" - B.A. @ 45 degrees to C.A., extensive alteration, fractures cross-cut B.A. @ 25 degrees to the C.A. 253'8"-254'11" - B.A. @ 50 degrees to C.A., fractures cross-cut B.A. @ 20 degrees to the C.A. 253'3"-256'5" - brecciation zone healed with quartz & chlorite, disseminated pyrite 1-2%, the fractures in this zone range from 0-40 degrees in both orientations to the C.A. 254'4"-264'9" - broken core, ground material 259'4"-259'11", indicating a zone of open, faulting, & shearing, this zone contains ~2% disseminated pyrite. 264'10"-265' - F_2 style warping within the plane of the beds, beds @ 50 degrees to the C.A. 265'3'-265'8" - F_1 style folding with a 3" wavelength. 265'10" - B.A. @ 0 degrees to the C.A., direct influence from the F_1 fold sequence within the core, core parallel fold hinge.	87-3-262	262.00	282.00	20.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 17 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		265'11"-271'2' - B.A. @ 40 degrees to the C.A. 271'8"-271'10" - a 2" quartz vein, white, barren, conformable to B.A. 272'1"-272'9" - F_1 style folds, 2-4" wavelength, could be ducite deformation, beds range around 40-50 degrees to the C.A., however, they reverse dip, fracture cleavage runs @ 40 degrees to the C.A. healed by quartz & chlorite. 274'11" - zone of ducite? concentric folding occurs. 274'10"-281'5" - zone of plastic deformation & ptsigmatic folding of the sericitized & chloritized red beds, these beds have been subsequently brecciated & healed by quartz, chlorite, sericite & pyrite.									
281'5"	284'11"	Dark green-black siltstone - plastic deformation is enhanced by quartz/carbonate infillings, parallel to the original beds, the scale of the folds is 1/8"-1/2", fracture cleavage occurs @ 40-55 degrees to the C.A.	87-2-282	282.00	292.00	10.00					
284'11"	286'11"	Extensive sericitization & > 1/2% disseminated pyrite.									
286'11"	287'4"	Black siltstone exhibiting 2"-3" wavelength F_1 folds.									
287'4"	287'11"	Healed shear zone - small 1/8" angular black siltstone fragments within milky-white quartz, the quartz appears to have replaced remanent bedding @ 50 degrees to the C.A. Within the quartz vein, the angular fragments also align parallel to original beds.									
287'11"	290'4"	Dark green-black siltstone - ducite deformation folds, scale 1/8"-1", general trend to B.A. @ 55 degrees to the C.A., 1% sulphides.									
290'4'	299'6"	Alteration colors range from tan-brown to light green, B.A. averages 40 degrees to the C.A., 1-2% sulphides, minor ducite deformation evident, brecciation & healing	87-3-292	292.00	312.00	20.00					

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NAME OF PROPERTY Woodstock PLYMOUTH ORE BODY

DIAMOND DRILL RECORD

HOLE NO 87 - 3 SHEET NO 18 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		by chlorite, sericite & quartz, parallel to the beds; the same minerals occur in cross-cutting fractures, which range from 0-60 degrees to the C.A.									
299'6"	302'10"	Interbedded black & red siltstone - B.A. @ 50 degrees at the top of the zone, & decreases to 20 degrees, the red beds are minor & rarely exceed 1/4" bedded sections, fractures run from 30-80 degrees to the C.A., this zone contains 1% pyrite.									
302'10"	312'8"	Altered red siltstone - 303' - B.A. @ 20 degrees to the C.A. 304'2"-306'7" - ductile deformation folds with a wave-length of 1/4"-1/2". 304'5" - fractures 15-40 degrees to the C.A., (C.C. beds), B.A. @ 5 degrees to the C.A. 305'6" - B.A. @ 3-5 degrees to the C.A., block faulted units, movement ~1/8"-1/2", planes of movement @ 70 degrees to the C.A. 306'6"-307'11" - zone of extensive seritization & silicification. 306'9" - fractures run @ 45 degrees to the C.A. 310'-310'11" - quartz/breccia zone. 311'2" - B.A. @ 45 degrees to the C.A. 310'11"-311'4" - zone of 5% pyrite.									
312'8"	336'4"	Seriticized green-black siltstone - boudinaged & fractured bedding @ 313'4", B.A. lies @ 40 degrees to the C.A., fractures which occur in a range from 0-30 degrees to the C.A., have been off-set by minor scale faulting, this zone contains between 1 & 2% pyrite. 315'1" - an isoclinally fold with a 1" wavelength. 318'-318'7" - zone of brecciation & faulting of boudinaged beds. 318'9"-319'7" - an open fault with fault gouge occurs.	87-3-312	312.00	336.33	24.33					

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 3 SHEET NO. 19 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		319'7"-323'6" - minor sericite overprints of chloritized beds, these beds lie @ 60 degrees to the C.A., this zone contains F_1 ductile folds with 1/2"-1" wavelengths. 324' - B.A. lies @ 50 degrees to the C.A. 331' - B.A. lies @ 45 degrees to the C.A. 336'4" - B.A. lies @ 65 degrees to the C.A. & cross-cutting fractures occur @ 25 degrees to the C.A.									
336'4"	341'10"	Potassic/silic altered red siltstone - 336'4" - B.A. @ 50 degrees to the C.A. & fractures cross-cut the bedding @ 50 degrees to the C.A. 336'7"-339'11" - a zone of brecciation occurs, many angular fragments, which occur in a matrix of epidote, have been boudinaged prior to brecciation, possible fault plane @ 15 degrees to the C.A. 340'9" - a tectonic F_1 fold occurs with a 4" wavelength.	87-3-336	336.33	346.58	10.25					
341'10"	342'11"	Green-black siltstone - cross-cutting fractures occur @ 25 & 55 degrees to the C.A. 342'9" - a 3" wide quartz vein lies conformable to the C.A. & the B.A. lies @ 70 degrees to the C.A.									
342'11"	346'7"	Sericitized red siltstone - ductile deformation, F_1 folds with 2" wavelength occur. 343'10" - this zone contains spots of hematite & 2% pyrite, chalcopyrite & native Au? This zone also contains cobalt stained pyrite, fractures cut the core from 20-60 degrees to the C.A.									
346'7"	351'	Black siltstone - this zone contains abundant F_2 style, closely folded ductile F_1 folds with 1/16"-2" wavelength, which often transpose along the limbs into discontinuity of beds, shearing overprints the folding along fracture cleavage which occurs @ 60-70 degrees to the C.A. 350'4" - B.A. occurs @ 90 degrees to the C.A., core	87-3-346	346.58	362.00	15.42					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 20 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
		perpendicular fold hinge.								
351'	352'9"	Red & minor black siltstone - B.A. lies @ 40 degrees to the C.A., fracture cleavage occurs @ 10 degrees to the C.A., this zone contains 1/16" hematite spots & F_1 style folds with 4" wavelengths, in addition, F_2 style folds occur with 1/4" wavelengths. 352'5"-352'9" - breccia occurs.								
352'9"	354'	Black siltstone occurs.								
354'	355'8"	Red siltstone - B.A. lies @ 40 degrees to the C.A., this zone contains hematite spots. 354'9"-355'8" - extensive potassic/silic alteration.								
355'8"	361'1'	Red siltstone - minor bands of black siltstone, (beds ≯ 1/2" thick), B.A. lies @ 60 degrees to the C.A., this zone is spotted with hematite & contains 1-2% pyrite, the beds are cross-cut by fractures that lie @ 30 degrees to the C.A., brecciation overprints the bedding & fractures, the breccia contains angular siltstone & a matrix of quartz.								
361'1"	422'6"	Red & black siltstone - 364'6" - ducite F_1 folding occurs with a 1/2" wavelength. 396'3"-397'5" - open faulting occurs. 412'7"413' - open faulting occurs. 415' - large blebs of pyrite ocuur in association with chalcopyrite. 415'1" - slickenslided fault plane occurs @ 45 degrees to the C.A., pyrite along fault plane. 415'6' - B.A. @ 35-50 degrees to the C.A. 415'7" - large blebs of pyrite occur. 415'11" - B.A. @ 38-45 degrees to the C.A. with sub-parallel fractures which occur @ 42 degrees to the C.A.	87-3-362 87-3-382 87-3-392 87-3-412	362.00 382.00 392.00 412.00	382.00 392.00 412.00 422.50	20.00 10.00 20.00 10.50				

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 21 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		417'6" - pyrite blebs are associated with quartz, chlorite & plagioclase. 418'2" - B.A. occurs @ 60 degrees to the C.A. 418'10" - B.A. lies @ 25-30 degrees to the C.A. & is associated with parallel fractures. 419'7" - slickenslides occur @ 50 degrees to the C.A. 422'-422'3" - small blebs of pyrite parallel to the B.A., * This unit, 174'2" to 422'6", is structurally continuous into the next unit.									
422'6"	606'6"	Grey-Green to Green-Black Siltstone:	87-3-422	422.50	432.00	9.50					
		This zone contains an uninterrupted sequence of finely-bedded chloritic siltstone. The protolith of this unit may have been a grey-black siltstone before alteration. This unit contains intercalations of grey-green siltstone. 423'3"-423'8" - ductile F_1 folding occurs. 424'-424'10" - a zone of healed faulting occurs. 425'1" - shearing & blebs of pyrite occur. 437'4" - B.A. lies @ 55 degrees to the C.A. & cross-cutting fractures occur @ 30 degrees to the C.A. 439'4" - B.A. lies @ 0 degrees to the C.A., core parallel fold hinge. 430'5"-432'10" - ductile F_1 folding is visible, 1-2" wavelength, pyrite occurs in this zone. 432'10"-438' - the core has been folded & subsequently brecciated. 433'8" - B.A. lies @ 40 degrees to the C.A. 439'3" - B.A. lies @ 49 degrees to the C.A., associated with pyrite. 441'3" - B.A. lies @ 38 degrees to the C.A. 443' - B.A. lies @ 50 degrees to the C.A. 443'5" - pyrite parallel to B.A. @ 50 degrees to the C.A.	87-3-432	432.00	462.00	30.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 22 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		444'2" - B.A. lies @ 50 degrees to the C.A. 446'10"-447'8" - quartz healed fractures occur @ 0 degrees to the C.A. 449'-449'10" - quartz healed fractures occur @ 35-70 degrees to the C.A.									
450'	456'	Relatively unaltered black siltstone - beds undistinguishable.									
456'	460'	Intercalated grey-green & black siltstone - this zone contains occasional beds @ 73 degrees to the C.A., and pyrite stringers are present.									
460'	467'10"	A zone of grey-green siltstone occurs - B.A. lies @ 63 degrees to the C.A.	87-3-462	462.00	492.00	30.00					
467'10"	479'4"	A zone of intercalated black & grey-green siltstone - B.A. lies @ 62 degrees to the C.A.									
479'4"	490'	This zone contains predominantly grey-green siltstone & minor black siltstone - B.A. lies @ 54 degrees to the C.A. * Note: From 490' to 600'6" - a zone of intercalated black & grey-green siltstone occurs. The exact relationship between the grey-green & black siltstone is difficult to determine, as these units have the appearance of ductile movement across still definable bedding directions & are complexly transposed by F_1 folding.	87-3-492	492.00	522.00	30.00					
		493' - B.A. @ 60 degrees to the C.A. 495' - B.A. @ 80 degrees to the C.A. 497' - B.A. @ 75 degrees to the C.A. 499' - B.A. @ 55 degrees to the C.A. 501' - B.A. @ 50 degrees to the C.A. 503' - B.A. @ 60 degrees to the C.A.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 23 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		505' - B.A. @ 60 degrees to the C.A. 507' - B.A. @ 60 degrees to the C.A. 507'-510' - zone of ductile F_1 folding, these beds have a wavelength of 1". 509' - B.A. @ 70 degrees to the C.A. 511' - B.A. @ 65 degrees to the C.A. 513' - B.A. @ 50 degrees to the C.A. 515' - B.A. @ 85 degrees to the C.A. - beds very indistinct. 517' - B.A. @ 70 degrees to the C.A. 519' - B.A. @ 70 degrees to the C.A. - beds very poorly defined - C.C. frat. @ 60 degrees to the C.A. 521' - B.A. @ 65 degrees to the C.A. 523' - B.A. @ 70 degrees to the C.A.	87-3-522	522.00	552.00	30.00					
523'	535'11"	Green-black, pyrite rich, & grey-green siltstone - 525' - B.A. @ 60 degrees to the C.A. 527' - B.A. @ 80 degrees to the C.A. 529' - beds indeterminate 531' - bedding is indistinct & occurs @ 80 degrees to the C.A. 531'-534' - a zone containing 1-2% disseminated pyrite. 533' - B.A. @ 75 degrees to the C.A. 535' - B.A. @ 80 degrees to the C.A. - lower contact sharp									
535'11"	567'	Grey-green siltstone - this zone contains ~1/2% very fine-grained disseminated pyrite. 537' - B.A. @ 85 degrees to the C.A. - beds indistinguishable. 539' - B.A. @ 85 degrees to the C.A. - beds indistinguishable. 541' - B.A. @ 75 degrees to the C.A. 543' - B.A. @ 60 degrees to the C.A. 545' - B.A. @ 60 degrees to the C.A. 547' - B.A. @ 60 degrees to the C.A.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 24 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON
		549' - B.A. @ 70 degrees to the C.A. 551' - B.A. @ 65 degrees to the C.A. 551'-559' - the zone changes gradually in color from grey-green to green-black. 553' - B.A. @ 65 degrees to the C.A. 555' - B.A. @ 60 degrees to the C.A. 557' - B.A. @ 65 degrees to the C.A., quartz filled cross-cutting fractures occur @ 50 degrees to the C.A. 557'2" - an F_1 style fold occurs with a 1/2" wavelength. 559' - B.A. @ 70 degrees to the C.A. 561' - B.A. @ 75 degrees to the C.A. 563'- B.A. @ 60 degrees to the C.A. 563'-564' - pyrite occurs in late ductiley folded calcite veins. 565' - B.A. @ 60 degrees to the C.A. 567' - B.A. @ 70 degrees to the C.A.	87-3-552	552.00	582.00	30.00				
567'	578'6"	This zone is predominantly grey-green siltstone which contains < 1/2% disseminated pyrite. 569' - B.A. @ 65 degrees to the C.A. 571' - B.A. @ 45 degrees to the C.A. 573' - B.A. @ 50 degrees to the C.A. 575' - B.A. @ 60 degrees to the C.A. 577' - B.A. @ 65 degrees to the C.A.								
578'6"	588'2"	Green-black siltstone - 579' - bedding indeterminate. 581' - B.A. @ 70 degrees to the C.A. 583' - core broken parallel to the B.A. which lies @ 75 degrees to the C.A. 585' - B.A. @ 85 degrees to the C.A., core perpendicular fold hinge. 587' - B.A. @ 75 degrees to the C.A.	87-3-582	582.00	602.00	20.00				
588'2"	600'1"	Intercalated grey-green & minor black siltstone -								

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 3 SHEET NO. 25 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		589' - B.A. @ ~80 degrees to the C.A. 591' - B.A. @ 50 degrees to the C.A. 589'-597' - F_1 style ductile folding occurs @ a 1/4-1/2" wavelength, this folding may be quite persostant below this section in the core. 595' - B.A. @ 55 degrees to the C.A. 598'-600'6" - there is a gradual compositional change in the rock, in which the amount of carbonate increases from near zero to ~10% of the ground matrix of the grey-green siltstone. The amount of calcite within veins also increases; these veins are ductilely deformed, the siltstone also contains a minor light blue mineral, celestite? The contact with the calcareous grey-green siltstone below, may be primary or possibly secondary. However, it is lithologically indistinguishable from the upper unit, except by the amount of carbonate.									
600'6"	635'	Grey-Green Calcareous Siltstone: Contains very fine-grained disseminated pyrite throughout, ~<1/4%. 603' - B.A. @ 60 degrees to the C.A. 609' - B.A. @ 60 degrees to the C.A. 617' - B.A. @ 60 degrees to the C.A. 621' - B.A. @ 60 degrees to the C.A. - ductile def. net evident. 623' - B.A. @ 60 degrees to the C.A. 626' - a 3" thick ductilely folded calcite vein occurs @ 40 degrees to the C.A., B.A. @ 60 degrees to the C.A. 633' - B.A. @ 60 degrees to the C.A. 635' - B.A. @ 60 degrees to the C.A. 635' - End of Hole	87-3-602	602.00	635.00	33.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED
DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY (M.I.S.P.)
HOLE NO. 87 - 4 . LENGTH 632 feet (193 m.)
LOCATION Trench Section T-2 Plymouth 0+40N 15+20E
LATITUDE _____ DEPARTURE _____
ELEVATION 123 m. AMSL AZIMUTH 118 Deg. Mag. DIP 45 degrees
STARTED Nov 1/87 FINISHED Nov 29/87

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

HOLE NO. 87-4 SHEET NO. 1 of 29

REMARKS _____

LOGGED BY J.D.PRINCE, B. Sc.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		B.A. = Bedding Angle C.A. = Core Axis									
0'	10'	Overburden.									
10'	13'7"	<u>Maroon-Red Siltstone:</u> This unit is characteristically maroon-red, however, sections can alter to tan-brown to pink in color. In addition, several distinct phases of brittle deformation have occurred which have overprinted previous tectonic & ductile deformational phases. Most of the brittle fractures/breccias, have been infilled with several generations of quartz & chlorite, plus one phase of feldspathization. This section is strongly magnetic.	87-4-10	10.00	13.58	3.58					
10'1"	10'7"	A zone of ductile & brittle deformation occurs; the fractures are healed by quartz, plagioclase, chlorite & < 1% pyrite. 10'3" - an F_1 style fold occurs with a 2 1/2" wavelength, which has been brecciated & healed by quartz & chlorite. This fold has been folded under brittle conditions as the beds have parted along bedding.									
10'8"	11'10"	A zone of strongly magnetic iron formation - 10'9" - tension gash sub-parallel to beds @ 38 degrees to the C.A. are infilled with quartz, chlorite, epidote, white feldspar & very minor pyrite.									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 4 SHEET NO. 2 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		10'11" - B.A. @ 42 degrees to the C.A. 11'8" - B.A. @ 48 degrees to the C.A. 11'10" - fractures parallel to beds & are infilled with white feldspar. 11'11" - B.A. @ 47 degrees to the C.A., parallel fractures infilled with white feldspar, cross-cutting fractures lie @ 35 degrees to the C.A. & also contain white feldspar. Tension gashes cut both fracture types. 12'3" - B.A. & parallel fractures occur @ 49 degrees to the C.A. 13' - B.A. @ 47 degrees to the C.A., the B.A. is structurally continuous into the next unit.									
13'7"	17'10"	<u>Grey-Green Siltstone with Minor Red Siltstone:</u> Some areas have a stippled texture caused by a pink colloform mineral, (rhodochrosite?) which overprints the bedding. 14'3" - B.A. @ 40 degrees to the C.A. & fracture cleavage cuts the B.A. @ 27 degrees to the C.A., infilled with chlorite. 15'11" - B.A. @ 55 degrees to the C.A. 16'-16'6" - a shear zone parallels B.A. & contains several phases of quartz & chlorite, as well as potassically altered portions of fragmented red bed. 17'-18' - the core is fragmented & ground by the drilling. 17'6"-17'7" - fracture @ 40 degrees to the C.A. infilled with quartz & minor chlorite. 17'10" - contact is ground but is structurally continuous into the next unit.	87-4-13	13.58	17.83	4.25					
17'10"	21'11"	<u>Maroon-Red Siltstone:</u>									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 3 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		The beds exhibit variable degrees of potassic/silic alteration. The color ranges from tan-red to maroon-red. Tectonic folding is exhibited throughout this unit.	87-4-17	17.83	21.92	4.09					
		18'5" - B.A. parallel fractures occur @ 35 degrees to the C.A. 18'4"-19' - tectonic F_1 style folds occur with a 3" wavelength. 19' - B.A. from 52-56 degrees to the C.A., cross-cutting fracture cleavage from 10-15 degrees to the C.A., infilled with quartz, chlorite, white feldspar & epidote, minor fractures parallel the B.A. & are healed with quartz. 19'8" - contact between maroon-red bed & potassic/silic rich bed is sharp @ 62 degrees to the C.A. 19'10"-20'4" - large fracture occurs @ 18 degrees to the C.A. & is healed by quartz & white feldspar. 20'11"-21'11" - potassic/silic altered red beds occur. 21'8" - B.A. from 42-48 degrees to the C.A. 21'11" - the contact with the lower unit is irregular, faulted & extensively altered.									
21'11"	33'	Green Siltstone with Minor Red Siltstone:	87-4-21	21.92	33.83	11.91					
		This unit exhibits varying degrees of potassic/silic & chloritic alteration & late stage quartz & chlorite filled fractures. 22'5" - a zig-zag fracture system sub-parallels B.A. @ 50 degrees & along cross-cutting fracture planes @ 40-50 degrees to the C.A. This zone is surrounded by potassic/silic alteration, the fractures are healed with chlorite & minor quartz. 24'-26' - bedding indistinguishable, fractures @ 5-17 degrees to the C.A. are healed with chlorite, quartz, minor white feldspar & epidote?									

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 4 SHEET NO. 4 of 25

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		26'-26'8" - B.A. @ 56 degrees to the C.A., cross-cutting fracture cleavage @ 38 degrees to the C.A. healed with quartz & chlorite, numerous en echelon tension gashes occur @ 0-20 degrees to the C.A., many of these tension gashes exhibit open style folding with F_1 type fold axis's. 26'10"-27'3" - a network of cross-cutting micro-fractures occur @ 0-40 degrees to the C.A. These fractures are healed with a complex carbonate or feldspar. This zone is spotted with the same minerals, the spots overprint the B.A. 27'7"-27'8" - a zone of 1/2" bands of red siltstone occur @ 58 degrees to the C.A., both upper & lower contacts are conformable, no apparent alteration of the red beds has occurred. The red beds are non-magnetic & no sulphides are visible. 28'6" - B.A. @ 47 degrees to the C.A. & cross-cutting fracture cleavage occurs @ 42 degrees to the C.A., healed with chlorite. 29'6"-29'8" - 2 bands of red siltstone occur within complex F_1 style folding, & subsequent faulting which occurs @ 14 degrees to the C.A., spotted green siltstone is interbedded within the red beds. 30'-30'6" - a potassic/silic altered zone of red silttone occurs, B.A. @ 47 degrees to the C.A. 31'1"-32' - a zone of brecciated green siltstone occurs, this section has been potassic/silic altered prior to brecciation, which occurs along both bedding planes @ 58 degrees to the C.A., & along cross-cutting fractures, which occur in various orientations. The fractures are healed by potash, feldspar, quartz, chlorite & epidote?. 32'-32'3" - maroon-red siltstone occurs @ 45 degrees to the C.A. & a cross-cutting fracture cleavage occurs @ 35 degrees to the C.A., this zone is brecciated & contains chlorite & white feldspar.									

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 4 SHEET NO. 5 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		32'10" - B.A. @ 61 degrees to the C.A., large C.C. fracture @ 27 degrees to the C.A., healed with quartz & minor chlorite, white feldspar, & epidote?.									
33'3"	33'10"	Finely interbedded maroon-red siltstone, pink altered siltstone & green potassic/silic altered siltstone, B.A. occurs @ 63 degrees to the C.A. 33'10" - the lower contact lies @ 63 degrees to the C.A., & the B.A. is structurally continuous into the next unit.									
33'10"	43'10"	<u>Interbedded Brick-Red & Maroon-Red Siltstone:</u> Both brick-red & maroon-red units are fairly constant in color, & are finely bedded. From 33'10" to 37'10", the unit is predominantly brick-red siltstone. 34'8" - B.A. @ 50 degrees to the C.A. & cross-cutting fractures occur @ 45 degrees to the C.A., healed by quartz, chlorite, minor white feldspar & epidote. 35' - B.A. @ 57 degrees to the C.A. 35'4"-35'5" - 1" parallel fracture space infilled with quartz, chlorite, & minor white feldspar. 36'6" - 1" band of maroon-red siltstone occurs, B.A. @ 66 degrees to the C.A., fractures parallel the B.A. & are infilled with chlorite & epidote?, tension gashes cross-cut the B.A. & fractures, these lie between 0-30 degrees to the C.A. 37'10"-39'7" - the red beds have been fractured & altered within these fractures by potassic/silic alteration, brecciated within the fractures & healed by chlorite, white feldspar, rhodochrosite, & quartz. 38'9" - B.A. @ 65 degrees to the C.A. 39' - B.A. @ 68 degrees to the C.A., while cross-cutting fractures occur @ 21 degrees to the C.A.	87-4-33	33.83	43.83	10.00					

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 4 SHEET NO. 6 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	TOTAL	%	%	OZ/TON	OZ/TON
		39'7" - B.A. & parallel fractures lie @ 62 degrees to the C.A., a 1" band of green siltstone occurs, containing boudinaged nodules of feldspar, which are being replaced by chlorite. 39'7"-40'11" - a zone of brick-red siltstone occurs, B.A. lies @ 72 degrees to the C.A. 40'11"-41'10" - micro-brecciated red siltstone, similar to the zone from 37'10"-39'7", except the brecciation is more extensive; B.A. @ 78 degrees to the C.A. while cross-cutting fracture cleavage occurs @ 20 degrees to the C.A. Late cross-cutting tension gashes overprint the bedding/cleavage, & these quartz filled veins lie @ 5 degrees to the C.A. 41'10"-43'10" - brick-red siltstone - B.A. @ 79 degrees to the C.A. 43'7"-43'10" - interbedded brick-red & green-grey siltstone occurs, B.A. @ 74 degrees to the C.A., these beds are micro-fractured, an F_1 style fold occurs within a 3/4" wavelength. The lower contact is structurally continuous & gradational into the lower unit.								
43'10"	268'5"	Interbedded Grey-Green to Black Siltstone with Maroon-Red Siltstone: This unit is characterized by extensive chloritic alteration, & minor zones of potassic/silic alteration. The potassic/silic zones are frequently associated with the red beds. This unit ranges in color from very pale tan to pinkish tan, within potassic/silic and/or red zones, to green-black, green-grey, tan-green in color, within chloritic zones.	87-4-43	43.83	50.00	6.17				
43'10"	55'7"	Potassic/silic alteration of siltstone, beds are very finely interbedded & range in color from pale tan, (pinkish								

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 7 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		in areas), to a pale yellowish tan, very minor chlorite beds. 44'9" - B.A. @ 79 degrees to the C.A. 45'3" - B.A. @ 80 degrees to the C.A. 46'4" - B.A. @ 85 degrees to the C.A. 47'8" - bedding is brecciated & healed by chlorite & quartz. 48'7" - B.A. & parallel fractures occur @ 65 degrees to the C.A. & are infilled by chlorite, cross-cutting fractures occur @ 0 degrees to the C.A., these are infilled with quartz. 48'-50'4" - thin section, micro-brecciation of green-grey siltstone occurred, one major phase chloritization & silicification is overprinted by micro-block faulting, in which drag folding of the quartz veins occurred, this was followed by a second phase of chloritization & silicification healing the resulting breccia. B.A. @ 60 dgrees to the C.A., this zone contains disseminated pyrite. 51'6"-57' - green-grey siltstone & fine interbeds of red siltstone occur @ 50 degrees to the C.A., siliceous-feldspathic beds have been elongated & several boudins have formed. 52'11" - B.A. @ 64 degrees to the C.A., boudins of quartz/feldspar parallel the B.A., pyrite is present in beds & nodules. 53'6" - B.A. @ 48 degrees to the C.A., late cross-cutting fractures occur @ 16 degrees to the C.A., these are healed by quartz & chlorite, disseminated pyrite occurs within the interbeds. 55' - B.A. @ 48 degrees to the C.A., contains siliceous boudins which align parallel to the B.A., fracture cleavage occurs @ 20 degrees to the C.A. 55'3" - B.A. @ 58 degrees to the C.A., cross-cutting fracture cleavage occurs @ 19 degrees to the C.A., healed with chlorite, boudins overprinted by chlorite parallel	87-4-50	50.00	70.00	20.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 8 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		to the B.A. 55'7" - B.A. @ 45 degrees to the C.A.									
55'7"	57'	Interbedded grey-green & red siltstone - beds range from dark grey-black to reddish black in color. 56'5" - B.A. @ 45 degrees to the C.A. 57' - lower contact is @ 45 degrees & is conformable.									
57'	58'	Grey-green siltstone - B.A. @ 62 degrees to the C.A. 57'6" - a minor F1 style fold occurs with a 2" wavelength.									
58'	59'4"	Dark maroon-black chloritic siltstone - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 22 degrees to the C.A., fractures healed with chlorite. 58'9" - a 1/4" wide chlorite filled micro-breccia occurs @ 5 degrees to the C.A.									
59'4"	63'4"	Grey-green siltstone - B.A. @ 46 degrees to the C.A. 61'11" - B.A. @ 54 degrees to the C.A. 62'7" - the core of an F_1 style tectonic fold occurs with a > 5" wavelength. This sub-unit is not structurally continuous into the next sub-unit, as brecciation destroys the continuity, however, a large F_1 fold appears to occur within this zone.									
63'6"	74'	Interbedded grey-green to black & maroon siltstone - the red beds have mobilized plastically/chemically, & occur within cross-cutting fractures. These cross-cutting fractures overprint the red beds which occur within grey-green beds. This conflicting overprinting relationship, leaves in doubt whether any finely bedded, ie > 1/16", are primary, as some can be seen to be secondary mobilization phenomena. 63'-63'10" - micro-breccia, chloritization & overprinted potassic/silic alteration occurs.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87-4 SHEET NO. 9 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	TOTAL	%	%	OZ/TON	OZ/TON	
		64'2" - B.A. @ 2-3 degrees to the C.A. 64'7" - B.A. @ 20 degrees to the C.A. 64'-68' - slickenslided open faults occur @ 10-20 degrees to the C.A., chlorite lines most of these cross-cutting fractures, previous micro-breccias occur within these faults; these contain chlorite, epidote & feldspar. 66'6" - B.A. @ 64 degrees to the C.A., cross-cutting fractures occur @ ~0 degrees to the C.A. 67'-67'11" - a black-grey chloritic alteration zone - 67'4" - B.A. @ 64 degrees to the C.A. 68'7" - B.A. @ 26 degrees to the C.A., cross-cutting fracture cleavage is @ 30 degrees to the C.A. 69'7" - B.A. @ 37 degrees to the C.A., cross-cutting fracture cleavage is @ 12 degrees to the C.A. 70'6" - B.A. @ 38-46 degrees to the C.A., parallel fractures healed by quartz. 70'10" - boudinaged beds conformable to bedding. 71'4" - boudinaged bedding occurs containing white feldspar. 71'6" - B.A. @ 48 degrees to the C.A. 71'6"-72' - maroon-black chloritic siltstone containing feldspathic boudins parallel to bedding. 71'9" - B.A. @ 42 degrees to the C.A. 72' - lower contact is conformable. 72'-74' - finely interbedded dark green chloritic siltstone. 72'5" - B.A. @ 52 degrees to the C.A. 73'1"-74' - the bedding has been brecciated & healed by quartz, white feldspar, chlorite & minor epidote?, beds have been block-faulted as well, however, bedding is consistently @ 50 degrees to the C.A. in the undisturbed portions.	87-4-70	70.00	90.00	20.00					
74'	91'6"	Interbedded red & grey-greensiltstone - This zone is extensively potassic/silic altered, it ranges in color from									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 10 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		pale tan (pinkish in areas) to yellowish tan, to maroon-black. This zone is sporatically mineralized with disseminated pyrite. 76'6" - B.A. @ 38 degrees to the C.A. 77'7" - B.A. @ 30 degrees to the C.A., cross-cutting fractures occur @ 0-5 degrees to the C.A., & have been healed by chlorite & epidote. Block faulting has offset the altered beds but not the 0-5 degree fractures. 78'8" - B.A. @ 42-46 degrees to the C.A. 82'5" - B.A. @ 31 degrees to the C.A. 81'6" - B.A. @ 38-45 degrees to the C.A., cross-cutting fractures are healed by quartz & occur from 20-30 degrees to the C.A. 82'1" - B.A. @ 44 degrees to the C.A. 82'10"-88' - bedding has been brecciated & block-faulted, potassic/silic altered & spotted by pink carbonate, (rhodochrosite?), which overprints the bedding. 84'2" - B.A. @ 24 degrees to the C.A. 86'1" - B.A. @ 48 degrees to the C.A. 87'3" - B.A. @ 49 degrees to the C.A., cross-cutting fracture cleavage occurs @ 40 degrees to the C.A., fractures are healed by quartz & fuchsite, disseminated pyrite occurs throughout this zone. 88'-110' - both intercalated & interbedded tan-green & black-green siltstone occurs. 88'5" - B.A. @ 39 degrees to the C.A. 89'6" - B.A. @ 48 degrees to the C.A. 90'6" - B.A. @ 62 degrees to the C.A. 91'6" - B.A. @ 40 degrees to the C.A., cross-cutting fractures occur @ 15 degrees to the C.A. 93'11" - the core of a tectonic F_1 fold occurs, which has a < 4" wavelength. 97' - B.A. @ 50 degrees to the C.A. 99' - B.A. @ 80 degrees to the C.A., however, the core of a fold is not present.	87-4-90	90.00	110.00	20.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 11 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		100' - B.A. @ 60 degrees to the C.A. 101'6"-104'2" - broken core which has broken across the bedding planes. 102'4" - an open fault occurs that lies @ 15 degrees to the C.A. 104'7"-107'8" - various boudinaged beds & feldspathic nodules occur, B.A. @ 55 degrees to the C.A. 109' - B.A. @ 30 degrees to the C.A.									
110'	112'	Red siltstone - this zone has been extensively altered by sericite, causing the siltstone to be tan-green to pale red in color; numerous feldspathic boudins are present. Minor F_1 style folding is present with a 1/8" wavelength. B.A. @ 40 degrees to the C.A., while cross-cutting fracture cleavage occurs @ 30 degrees to the C.A.	87-4-110	110.00	112.00	2.00					
112'	166'6"	Interbedded grey-green to green-black & maroon siltstone. This zone heavily chloritized, fractured & boudinaged; potassic alteration is uncommon. 112'5" - B.A. @ 35 degrees to the C.A., cross-cutting fracture cleavage occurs @ 50 degrees to the C.A. 116'4" - a minor F_1 style tectonic fold occurs, with a 1/8" wavelength. 117'2"-118'2" - an interbedded brecciation of the core occurred, with the angles trending around 0-20 degrees to the C.A.. The breccia is healed mostly by white feldspar, late fractures @ 0 degrees to the C.A. are healed by epidote. 119'10" - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage occurs @ 22 degrees to the C.A. 120'-124'5" - this zone is mainly composed of red siltstone with thin 1/8" chlorite bands. Boudins filled with secondary feldspar & silic are common. 121' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage occurs @ 28 degrees to the C.A.	87-4-112	112.00	130.00	18.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 12 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		124'6" - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage occurs @ 60 degrees to the C.A., pyrite occurs along the bedding planes, replacing hematite; in addition, the pyrite cross-cuts the B.A. along tension gashes @ 0-10 degrees to the C.A. 125'2"-126'2" - a chlorite filled, slickenslided open fault occurs @ 20 degrees to the C.A. 126'6" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage occurs @ 35 degrees to the C.A. 128'5" - the core of an F_1 ductile fold occurs, this has a < 3" wavelength. 129'-129'8" - an open fault occurs @ 16 degrees to the C.A., this contains late phase rosettes of calcite & pyrite. 130'4" - B.A. @ 50 degrees to the C.A., fractures cross-cut the B.A. & occur @ 23 degres to the C.A. 130'8"-137'2" - the core is out of place & is not in situ, however, the B.A. in general is @ 25 degrees to the C.A., within this zone a 20" open fault occurs @ 5 degrees to the C.A., & the core of an Fl style tectonic fold occurs, with a < 7" wavelength. 138'7"& 139'9" - the cores of an F_1 style tectonic fold occurs, the wavelength between the two is 15". The B.A. in general lies @ 0 degrees to the C.A., fracture cleavage does not reverse the dip while passing through those folds, & occurs @ 20 degrees to the C.A. 140'8"-141'1" - micro-breccia occurs, which is healed by mylonized green siltstone, chlorite & white feldspar. 141'3" - B.A. @ 20 degrees to the C.A., cross-cutting fracture cleavage occurs @ 60 degrees to the C.A. 143'5" - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage occurs @ 40 degrees to the C.A. 146'6" - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage occurs @ 40 degrees to the C.A. 148'1"-149'2" - this zone contains red siltstone,	87-4-130	130.00	150.00	20.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 13 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		containing abundant boudins filled with feldspar & quartz. Many boudins exhibit rims of secondary pyrite & chlorite, several are rose-colored suggesting these boudins were originally red beds. B.A. @ 26 degrees to the C.A.									
		149'5" - a slickenslided fault indicates dip movement, the fault occurs @ 30 degrees to the C.A. & cross-cuts the B.A. @ 35 degrees to the C.A.									
		150'-153'2" - this zone is similar to 138'1"-139'2", with minor interbeds of green-black siltstone, B.A. @ 35 degrees to the C.A., cross-cutting fracture cleavage lies @ 40 degrees to the C.A.	87-4-150	150.00	170.00	20.00					
		155'6"-156'3" - green siltstone contains abundant red spotting, which overprint the bedding planes, B.A. @ 50 degrees to the C.A., cross-cutting fracture healed with chlorite & epidote lie @ 20 degrees to the C.A.									
		156'2" - B.A. @ 55 degrees to the C.A., a fault healed with apatite & fuchsite? cross-cuts the B.A. & occurs @ 20 degrees to the C.A.									
		157'4" - B.A. @ 35 degrees to the C.A., sub-parallel fractures occur @ 20 degrees to the C.A., cross-cutting fractures occur @ 40 degrees to the C.A. & pyrite filled tension gashes occur @ 5 degrees to the C.A.									
		158'4" - a secondary tension gash is filled with radiating crystals of lime-green wavellite?, quartz & rhodocrosite.									
		159'2"-160'2" - micro-breccia occurs which has been healed by quartz, chlorite & epidote. A fault overprints this breccia & lies @ 25 degrees to the C.A., the fault is lined with chlorite & pyrolusite?.									
		160'8" - B.A. @ 0 degrees to the C.A., fracture cleavage lies @ 35 degrees to the C.A., the B.A. has overprinted red spots, enhancing the bedding planes.									
		162'8" - B.A. @ 30 degrees to the C.A., fractures cross-cut the bedding & occur @ angles from 0-20 degrees in both orientations to the C.A., secondary pyrite filled many									

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 4 SHEET NO. 14 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		fractures & is associated with quartz & white feldspar. 166'2"-166'5" - a band of red siltstone beds occur, B.A. @ 50 degrees to the C.A. 167'3"-167'6" - micro-breccia occurs which is healed with quartz, white feldspar & secondary chlorite & pyrite.									
166'6"	182'	This zone predominantly contains 12" brown-red siltstone sections & interbedded 4" chloritic sections. These red beds contain only rare boudins. 168' - B.A. @ 52 degrees to the C.A. 170'9" - B.A. @ 52 degrees to the C.A. 173' - B.A. @ 62 degrees to the C.A., cross-cutting fracture cleavage lies @ 20 degrees to the C.A. 174'-178' - an abundance of faults occur which cross-cut the bedding & occur @ angles ranging from 40-75 degrees to the C.A. 176'3" - B.A. @ 60 degrees to the C.A. 178'6"-178'10" - healed breccia contains quartz, chlorite & epidote, small scale mylonization has occurred within this zone. 181' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage occurs @ 25 degrees to the C.A.	87-4-170	170.00	182.00	12.00					
182'	195'10"	Interbedded green-black & red siltstone - 182'6" - B.A. @ 50 degrees to the C.A., cross-cutting fractures occur @ 20-25 degrees to the C.A. 182'-186' - this zone is rich in manganese, the red & black beds are very finely bedded & this zone has a very metallic luster. 186'-189'9" - the siltstone has been discolored to a red-brown, secondary chlorite is common; the core is broken from 189'11"-191'1", this area is heavily chloritized & faulted @ 50 degrees to the C.A. sub-parallel to B.A., these fractures are healed with chlorite & epidote. 189'8"-190'3" - the B.A. has been silific/feldspathically	87-4-182	182.00	195.83	13.83					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 15 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		altered. 190'3"-191'10" - this is the same as 182'-186', B.A. from 45-0 degrees to the C.A., fractures cut the B.A. & occur 15 degrees to the C.A.,a thin section of blue bands occur as a secondary replacement within this zone. 193'1" - the core of an F_1 style tectonic fold occurs within a > 15" wavelength. 193'4"-195'4" - a breccia has destroyed the down hole limb of the major F_1 fold occurring in this zone, fractures overprint the breccia & are healed by chlorite, wavellite? & calcite, the calcite has been brecciated & may be earlier than the other two minerals.									
195'10"	206'	Interbedded brown-red & green-black siltstone - same as 186'-189'9". 198'3" - B.A. @ 50 degrees to the C.A., cross-cutting fractures occur @ 25 degrees to the C.A., fractures are healed with chlorite & calcite. 199'11"-200'3" - minor boudinage of beds occur, small secondary rhodochrosite vein cuts B.A. & occurs @ 5 degrees to the C.A., several inches of core are missing. 200'-201' - chlorite filled fracture occurs @ 10 degrees to the C.A., minor mylonization occurs along this fracture plane. 201' - fracture overprints earlier micro-breccia, breccia is healed with calcite. 202'2" - B.A. @ 51 degrees to the C.A. 204'6"-205'3" - minor brecciation occurs, which is over-printing prior ductile deformation, B.A. @ 0-10 degrees to the C.A.	87-4-195	195.38	206.00	10.17					
206'	231'10"	Interbedded green-black & red siltstone - 206'3" - B.A. @ 45 degrees to the C.A., cross-cutting fracture occurs @ 38 degrees to the C.A. 206'5" - a minor F_1 style fold occurs with a 1" wavelength.	87-4-206	206.00	220.00	14.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 16 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		207'5"-208'9" - breccia occurs, B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage occurs @ 25 degrees to the C.A. 209'8" - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage occurs @ 38 degrees to the C.A. 211' - B.A. @ 60 degrees to the C.A. 210'-213' - boudins are common, typically infilled with feldspathic material. 212'9" - the core of an F_1 style tectonic fold occurs, it has a > 3" wavelength, boudins here have been folded along fold hinge, indicating boudinage occurred before F_1 tectonic folding, or indicating previous folding or ductillity, several boudins in this area show evidence of original red beds they were produced from. 214'-216'3" - brecciation occurs & overprnts previous folding & boudinage, the fractures occur in a range from 0-20 degrees to the C.A. 216'6" - B.A. @ 60 degrees to the C.A., cross-cutting fracture occurs @ 16 degrees to the C.A. 218'6" - F_1 tectonic fold occurs with a > 7" wavelength. 219' - B.A. @ 49 degrees to the C.A. 220'-227'2" - an abundance of boudins occurs. 221' - B.A. @ 48 degrees to the C.A., cross-cutting fracture occurs @ 30-0 degrees to the C.A. 226'7"-227' - minor zone of potassic/silic alteration occurs, B.A. @ 70 degrees to the C.A. 229' - B.A. @ 66 degrees to the C.A., cross-cutting fractures occur @ 30-40 degrees to the C.A. 231' - B.A. 2 55 degrees to the C.A. 230'9"-231'4" - a zone of pyrite lenses parallel to the B.A., ~5% pyrite. 231'10" - B.A. is structurally continuous.	87-4-220	220.00	231.83	11.83					
			87-4-231	231.83	246.00	14.17					
231'10"	261'4"	Interbedded red & minor red-black siltstone - variably altered by potassic/silic alteration, predominantly within									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 17 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		the red beds. 235' - B.A. @ 52 degrees to the C.A., minor boudinaged beds occur, fractures cross-cut the B.A. & occur @ 0-20 degrees to the C.A., fractures are healed by quartz & carbonate. 237' - B.A. @ 52 degrees to the C.A., cross-cutting fracture cleavage occurs @ 40 degrees to the C.A. 239' - B.A. @ 72 degrees to the C.A., cross-cutting fracture cleavage occurs @ 20-30 degrees to the C.A. 241' - B.A. @ 65 degrees to the C.A., cross-cutting fracture cleavage occurs @ 36 degrees to the C.A. 243' - B.A. @ 47 degrees to the C.A. 244'7"-245'7" - F_1 tectonic S fold occurs in fold. 245' - B.A. @ 0 degrees to the C.A., center of F_1 S fold, cross-cutting fracture cleavage occurs @ 55 degrees to the C.A.	87-4-246	246.00	261.30	15.30					
		247' - B.A. @ 25 degrees to the C.A. 245'6"-251'7" - potassic/silic altered red siltstone. 249' - B.A. @ 15 degrees to the C.A., cross-cutting fracture cleavage occurs @ 54 degrees to the C.A. 251' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage occurs @ 0-10 degrees to the C.A., fracture cleavage lies ~17 degrees to the C.A. 253' - B.A. @ 70 degrees to the C.A., cross-cutting fracture cleavage occurs @ 24 degrees to the C.A. 254'9"-255'9" - fault occurs @ 20 degrees to the C.A. parallel to fracture cleavage. 255' - B.A. @ 65 degrees to the C.A. 256'6" - B.A. @ 75 degrees to the C.A. 256'6"-260'6" - ptygmatic folding occurs with a 4-5" wavelength, three folds are observed in this zone. 261' - B.A. @ 35 degrees to the C.A.									
261'4"	265'7"	Green-black siltstone - this unit is heavily chloritized & bedding is indistinct, fractures & fracture cleavage	87-4-261	261.30	268.42	7.12					

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NAME OF PROPERTY Woodstock PLYMOUTH ORE BODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 18 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		are commonly very thin & filled with quartz & feldspar. 262'3"-263'4" - broken core with faulting planes occur, fault planes lie @ 65 degrees to the C.A., fracture cleavage cross-cuts faults & occurs @ 16 degrees to the C.A. 265' - B.A. @ 40 degrees to the C.A. 267' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage occurs @ 40 degrees to the C.A.									
265'7"	268'5"	Same as 231'10"-261'4" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage lies @ 40 degrees to the C.A.									
268'5"	451'4"	<u>Interbedded Green-Black Siltstone with Red-Black Siltstone:</u> Very slatey bedding cleavage - 271' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage occurs 25 degrees to the C.A. 271'4"-272'3" - micro-breccia of green siltstone. 273' - B.A. @ 80 degrees to the C.A., core perpendicular fold hinge. 275' - B.A. @ 65 degrees to the C.A., cross-cutting fracture cleavage occurs @ 30 degrees to the C.A. 277' - a brecciated tectonic F_1 S fold occurs, B.A. is not structurally continuous in surrounding beds, wavelength of S fold is > 4". 279' - B.A. @ 70 degrees to the C.A. 280'6"-281'9" - brecciated red beds occur, healed with chlorite @ brecciated feldspar-quartz, < 1% sulphides within breccia. 283' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 5-40 degrees to the C.A. 279'2"-292'4" - section of red siltstone occurs with	87-4-268 87-4-280	268.42 280.00	280.00 300.00	11.58 20.00					

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NAME OF PROPERTY Woodcock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 19 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	TOTAL	%	%	OZ/TON	OZ/TON	
		indeterminate bedding planes.									
		289'10" - B.A. @ 65 degrees to the C.A., small Z fold occurs, both limbs retain a 65 degree bedding direction.									
		291' - B.A. @ 60 degrees to the C.A.									
		293' - B.A. @ 60 degrees to the C.A.									
		295' - B.A. @ 60 degrees to the C.A.									
		296' - B.A. @ 50 degrees to the C.A., cross-cutting fracture occurs @ 35 degrees to the C.A.									
		299' - B.A. @ 45 degrees tc the C.A., cross-cutting fracture cleavage @ 50 degrees to the C.A.									
		301' - an F_1 tight fold occurs with a > 6" wavelength.	87-4-300	300.00	320.00	20.00					
		301'4"-302'11" - quartz filled breccia occurs, destroying lower limb of fold.									
		302'6" - fault planes & fracture filled quartz veins occur @ 32 degrees to the C.A.									
		303'11" - a tight F_1 fold occurs.									
		304'2" - B.A. @ 40 degrees to the C.A., this zone contains minor Z folds.									
		305'2"-306' - brecciated core, bedding within breccia lies @ 52 degrees, & cross-cutting fracture @ 50 degrees to the C.A., quartz & feldspar veins parallel the bedding planes, carbonate parallels fracture planes.									
		308'5" - B.A. @ 60 degrees to the C.A.									
		309'10" - B.A. @ 46 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A., 2% pyrite.									
		312'8" - B.A. @ 70 degrees to the C.A., pyrite enhances bedding planes in this section of core.									
		313'10"-314'6" - zone of brecciation occurs healed by quartz & chlorite.									
		318'4" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 25 degrees to the C.A.									
		320'10"-321'4" - 2 isoclinical folds occur with a 3" wavelength.	87-4-320	320.00	330.00	10.00					
		323' - B.A. @ 70 degrees to the C.A.									
		324'3" - B.A. @ 60 degrees to the C.A.									

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 4 SHEET NO. 20 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		326'3" - B.A. @ 60 degrees to the C.A. 329'8" - B.A. @ 62 degrees to the C.A. 330'2"-330'5" - an F_1 tectonic fold occurs, folding quartz/feldspar boudins within interbeds of green-black siltstone. 333' - B.A. @ 65 degrees to the C.A. 335' - B.A. @ 60 degrees to the C.A. 337' - B.A. @ 60 degrees to the C.A. 339' - B.A. @ 70 degrees to the C.A. 341' - B.A. @ 65 degrees to the C.A. 343' - B.A. @ 60 degrees to the C.A. 345' - B.A. @ 62 degrees to the C.A., Note: green & black siltstone beds are intercalated. 347'8" - B.A. @ 75 degrees to the C.A. 349' - B.A. @ 65 degrees to the C.A. 351' - B.A. @ 60 degrees to the C.A.	87-4-330	330.00	350.00	20.00					
		353' - B.A. @ 61 degrees to the C.A. 355' - B.A. @ 60 degrees to the C.A. 359' - B.A. @ 70 degrees to the C.A. 361' - B.A. @ 78 degrees to the C.A. 365' - B.A. @ 80 degrees to the C.A., core perpendicular fold hinge. 365'10"-367'6" - broken core occurs & faults cross-cut B.A. @ 60 degrees, fault planes lie in a range from 0-40 degrees to the C.A. 368'5" - B.A. @ 70 degrees to the C.A., bedding planes are enhanced by pyrite. 370'8" - a tight F_1 tectonic fold occurs. 371' - B.A. @ 70 degrees to the C.A. 372'6"-373'11" - faults break core & lie @ 13 degrees to the C.A., bedding is deformed to parallel fault planes, S style drag folds occur below fault @ 373'11", B.A. @ 50 degrees to the C.A. 375' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 47 degrees to the C.A.	87-4-350	350.00	360.00	10.00					
			87-4-360	360.00	370.00	10.00					
			87-4-370	370.00	390.00	20.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 21 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		376'2"-377'10" - broken core occurs, fault planes within this zone are @ 50-80 degrees to the C.A. 378' - B.A. @ 32 degrees to the C.A. 379'7" - B.A. @ 20 degrees to the C.A., fault planes sub-parallel bedding planes. 380'4" - B.A. @ 20 degrees to the C.A., cross-cutting fracture cleavage @ 65 degrees to the C.A., cleavage is healed by quartz & feldspar. 381'1"-381'5" - quartz/feldspar healed breccia zone occurs sub-parallel to B.A., late fractures overprint breccia zone & healed by epidote & chlorite @ 10 degrees to the C.A. 382'1" - an isoclinical F_1 tectonic fold occurs with a > 3" wavelength. 382' - B.A. @ 45 degrees to the C.A., cross-cutting breccia fractures are healed by light green radiating crystals of wavellite? 385' - B.A. @ 60 degrees to the C.A., 2 phases of folding occur along bedding @ angles between the 2 fold axis planes, being ~30 degrees to each other in planes perpendicular to the C.A. 387' - an irregular formed quartz vein cross-cuts the bedding sub-parallel to cross-cutting fracture cleavage, which lies @ 20 degrees to the C.A., B.A. @ 40 degrees to the C.A. 388'-388'11" - a minor potassic alteration of core has occurred, B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A. 390'-391'4" - broken core, B.A. @ 50 degrees to the C.A. 391'8" - core of tectonic Z fold. 393' - core of a tight F_1 tectonic fold with a 19" wavelength, cross-cutting fracture cleavage @ 30 degrees to the C.A. 394' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30-40 degrees to the C.A., these	87-4-390	390.00	410.00	20.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 22 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		fractures are healed with quartz & chlorite. 395'10"-396'5" - a bedding parallel breccia zone occurs in core, fracturing & displacing quartz/feldspar boudins. 396'11" - core of a large open F_1 tectonic fold with an up-core limb @ 45 degrees & down-core limb @ 20 degrees, bedding within folds is enhanced by pre-existing boudins. 398'6" - core of an open F_1 tectonic fold occurs, up-core limb exhibits Z folds & down-core limb exhibits S folding, up-core limb occurs @ 30 degrees & down-core limb occurs @ 80 degrees to the C.A. 399' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 401' - B.A. @ 70 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 403' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 25 degrees to the C.A. 405' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 24 degrees to the C.A. 405'7"-408' - micro-breccia overprints predominantly red siltstones & micro-breccia lies @ 0-30 degrees to the C.A., healed by quartz, chlorite & wavellite. 408'11" - core of an F_1 style tectonic fold occurs, up-core limb contains S folds & lies @ 40 degrees, down-core side lies @ 38 degrees to the C.A. 409'-410'5" - lost core fragments remaining do not indicate a fault. 411' - B.A. @ 60 degrees to the C.A. 413' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A. 414'-414'10" - micro-breccia occurs healed by quartz & chlorite. 415' - B.A. @ 60 degrees to the C. a., cross-cutting fracture cleavage @ 20 degrees to the C.A. 416'8"-419'2" - chlorite filled micro-breccia parallels fracture cleavage & lies @ 20 degrees, B.A. @ 60 degrees	87-4-410	410.00	420.00	10.00					
			87-4-420	420.00	440.00	20.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 21 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		to the C.A. 421' - B.A. @ 45 degrees to the C.A., cross-cutting frature cleavage @ 30 degrees to the C.A. 422'4" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 50 degrees to the C.A. 426'7" - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 427'3" - minor S fold occurs in core. 429' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A., bedding sub-parallel fractures lie @ 10 degrees to the C.A. 431' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A., some of the fractures are healed by quartz, chlorite & pyrite. 433' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A. 435' - B.A. @ 55 degrees to the C.A. 439' - B.A. @ 50 degrees to the C.A. 441' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 443' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 445' - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 22 degrees to the C.A. 447' - B.A. @ 50 degrees to the C.A. 449' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 450'6" - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 451'4" - bedding is structurally continuous into next unit.	87-4-440	440.00	451.30	11.30					
451'4"	571'	<u>Interbedded Grey-Green & Maroon-Red to Brick-Red Siltstone:</u>									

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NAME OF PROPERTY Woodstock PLYMOUTH ORE BODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 24 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		Unit is typified by red beds that are boudinaged & both red & green-grey siltstone units, which are potassic/silic altered.									
451'4"	467'5"	Maroon-red to brick-red siltstone & minor interbedded grey-green siltstone. 453' - B.A. @ 50 degrees to the C.A., cross-cuting fracture cleavage @ 30 degrees to the C.A., both foliation directionshave secondary fracturing, healed by quartz, chlorite & carbonate, fault plane parallel fracture direction. 455' - B.A. @ 52 degrees to the C.A. 457' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 50 degrees to the C.A. 455'4"-469'4" - unit is predominantly maroon-red siltstone with tan-green potassic/silic alteration. 459' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 459'11" - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 460'5" - a 1/2" band of micro-brecciate beds lie parallel to B.A. @ 40 degrees to the C.A., breccia is healed by epidote, quartz, carbonate, chlorite & decomposed feldspar, fracture cleavage overprints breccia zone. 462'4" - bedding shows evidence of intercalation of green & maroon-red siltstone & chemical remobilization. 463'11" - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A., folding is evident. 463'9"-465' - an isoclinical F_{1B} fold occurs within the fold which has a similar style to F_1 folds, however, plunge orientation is different with respect to the core orientation. * Note: From evidence in core, F_1 appear to horizontal	87-4-451	451.30	460.00	8.70					
			87-4-460	460.00	470.00	10.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 25 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		normal folds parallel to regional 050-070 degrees trend, the F_{1B} folds seem to be a plunging normal fold & is coaxial to F_1 fold axis plane, the F_2 style folds appear to trend roughly 90 degrees to the F_1 - F_{1B} folds, & are reclined folds. 465'3"-465'8" - brecciate red siltstone occurs healed by carbonate. 466' - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A.									
467'5"	503'5"	Grey-green siltstone & minor interbedded zones of maroon & brick-red siltstone - 471' - B.A. @ 36 degrees to the C.A. 474'3" - fault cross-cuts B.A. & lies @ 30 degrees to the C.A. 476'3" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 22 degrees to the C.A. 478' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A. 481' - B.A. @ 60 degrees to the C.A. 483'6" - B.A. @ 55 degrees to the C.A. 485'6" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 25 degrees to the C.A. 484'6"-488'4" - zone of faulting & broken core, fault occurs @ 0-45 degrees to the C.A. 489'6" - B.A. @ 60 degrees to the C.A. 491' - B.A. @ 45 degrees to the C.A. 493' - B.A. @ 44 degrees to the C.A. 493'-496' - the predominately green slate contains large aggregates of secondary pyrite. 495' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A. 496'9" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 498'10" - B.A. @ 45 degrees to the C.A.	87-4-470 87-4-480	470.00 480.00	480.00 503.42	10.00 23.42					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 26 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		499'-499'7" - faulted broken core occurs, fault planes @ 30-55 degrees to the C.A. 501' - B.A. @ 35 degrees to the C.A. 503' - B.A. @ 50 degrees to the C.A. 503'5" - bedding is structurally continuous into next unit.									
503'5"	539'9"	Maroon-red & brick-red siltstone, with minor section affected by potassic alteration. 503'5"-504'7" - broken core, faults lie @ 38 degrees to the C.A. & parallel bedding, cross-cutting faults occur @ 10 degrees to the C.A. 505' - B.A. @ 45 degrees to the C.A. 505'10" - B.A. @ 26 degrees to the C.A. 505'11"-507'1" - broken core, fault lies parallel to B.A. @ 30 degrees to the C.A. 507'6" - B.A. @ 32 degrees to the C.A., cross-cutting fracture cleavage @ 34 degrees to the C.A., parallel to fracture cleavage secondary brown radiating crystals of wavellite & also ciated carbonates overprint the bedding. 509'6" - B.A @ 50 degrees to the C.A. 511'5"-511'6" - zone of secondary? grey micro-crystalline sediment parallel to B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 48 degrees to the C.A. exhibits micro-folding-plastic deformation? 513' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 48 degrees to the C.A. 517' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 60 degrees to the C.A., secondary rhodochrosite & wavellite follow fractures. 513'-522'9" - red siltstone containing an abundance of secondary rhodochrosite & wavellite. 520'1" - B.A. @ 40 degrees to the C.A. 522' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 46 degrees to the C.A. 527'2" - B.A. @ 56 degrees to the C.A., cross-cutting	87-4-503 87-4-520	503.42 520.00	520.00 539.75	16.58 19.75					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 27 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		fracture cleavage @ 37 degrees to the C.A. 529' - B.A. @ 64 degrees to the C.A., bedding cleavage is very slatey. 531' - B.A. @ 62 degrees to the C.A. 533' - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 27 degrees to the C.A. 535' - B.A. @ 61 degrees to the C.A. 537' - B.A. @ 60 degrees to the C.A. 537'7"-539'5" - faults cross-cut bedding & range from 10-55 degrees to the C.A. 539' - B.A. @ 52 degrees to the C.A.									
539'9"	550'11"	Interbedded grey-green & minor maroon-red siltstone. 541' - B.A. @ 65 degrees to the C.A. 543' - B.A. @ 60 degrees to the C.A. 546'5" - B.A. @ 68 degrees to the C.A. 548'-548'10" - core of F_1 box fold occurs, imposed over this is F_{1B}, Z & S folds down-core from axis of box fold. 549' - B.A. @ 45 degrees to the C.A. 550'11" - bedding is structurally continuous into next zone.	87-4-539	539.75	550.92	11.17					
550'11"	571'	Interbedded maroon-red & black siltstone - 553' - B.A. @ 80 degrees to the C.A. 552'-552'7" - series of F_1 folds with 1/2" wavelengths. 555' - B.A. @ 6 degrees to the C.A., core parallel fold hinge. 555'10"-556'11" - breccia zone filled with secondary wavellite, feldspar, & carbonate. 559'3" - B.A. @ 25 degrees to the C.A. 561' - B.A. @ 12 degrees to the C.A., cross-cutting fracture cleavage @ 7 degrees to the C.A. 563' - B.A. @ 27 degrees to the C.A. 565' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 23 degrees to the C.A.	87-4-550	550.92	561.00	10.08					
			87-4-561	561.00	571.00	10.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 28 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		566'-568'5" - aggregates of secondary pyrite occur in red siltstone. 569' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A. 570'11" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A.									
571'	632'	<u>Intercalated Grey-Green Siltstone & Black Siltstone Interbedded with Maroon-Red Siltstone:</u> 572' - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 575' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 27 degrees to the C.A. * Note: This unit appears to be red siltstone overprinted by green-grey coloration, pseudo nodules occur within this unit. 579' - B.A. @ 84 degrees to the C.A., core perpendicular fold hinge. 579'6"-584' - F_1 style folds occur with an ~7-10" wavelength. 580'4" - core of tight F_1 fold occurs, upper core limb lies @ 30 degrees & the down core limb @ 20 degrees to the C.A. 582'11" - core of an open F_1 fold, upper core limb lies @ 30 degrees & the down core limb @ 28 degrees to the C.A., wavelength is > 5". 585' - B.A. @ 60 degrees to the C.A. 585'-589' - broken core, fault planes range from 10-40 degrees to the C.A. 587'10" - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A. 589'2"-590'10" - brecciated black siltstone.	87-4-571	571.00	580.00	9.00					
			87-4-580	580.00	600.00	20.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 4 SHEET NO. 29 of 29

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		593' - B.A. @ 62 degrees to the C.A. 597' - B.A. @ 65 degrees to the C.A., cross-cutting fracture cleavage @ 22 degrees to the C.A. 598'-599' - brecciated & broken core, fault planes occur @ 10-30 degrees to the C.A. 599'-599'8" - lost core. 600'-601' - broken core. 601' - B.A. @ 65 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A. 603' - B.A. @ 47 degrees to the C.A., cross-cutting fracture cleavage @ 45 degrees to the C.A. 604'4" - quartz/feldspar veins @ 10 degrees & are cut by later chlorite veins, which occur @ 80-90 degrees to the C.A. 603'-616' - potassic/silic altered core. 605'8"-606'4" - ground & broken core, cross-cutting fault planes cross B.A. & lie @ 30-40 degrees to the C.A. 606'4"-611' - lost core. 611'-612'8" - ground & broken core includes fragments of quartz. 613' - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 37 degrees to the C.A. 614'-615' - potassic/silic altered siltstone, breccia healed by quartz & wavellite, B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A. 615'4"-615'9" - black & red siltstone lie @ 57 degrees to the C.A., cross-cutting fracture cleavage @ 45 degrees to the C.A. 615'9" - End of Hole - However, if directly measured, the drill stem length was 632'. Core recovery from 606'4"-632' was 25%.	87-4-600 87-4-611	600.00 611.00	606.30 615.75	6.30 4.75					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED
DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY (M.I.S.P.)
HOLE NO. 87 - 5 LENGTH 462 feet (141 m.)
LOCATION Trench Section T-2 Plymouth 0+50 S 17+50 E
LATITUDE _____ DEPARTURE _____
ELEVATION 123m AMSL AZIMUTH 118 MAG. deg DIP 45 degrees
STARTED Dec 1/87 FINISHED Dec 18/87

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

HOLE NO. 87-5 SHEET NO. 1 of 17

REMARKS _____

LOGGED BY J.D.PRINCE, B.Sc.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		B.A. = Bedding Angle C.A. = Core Axis									
10'	70'3"	Interbedded Grey-Green and Minor Red Siltstone:	87-5-10	10.00	20.00	10.00					
		This unit is heavily chloritized and potassic/silic altered, making estimates of how much of this section was original iron formation difficult. Boudinaged beds are persistent throughout the red siltstone section; secondary chlorite and quartz occur within fracture cleavage planes. This area of siltstone contains a pronounced deep zone of weathering down to approximately 30' in the core. Many of the fractures and faults within this zone contain very oxidized ankerite, plus iron sulphides along open planes.									
		10'-11'4" - The B.A. is very chaotic and disturbed, boudinaged red beds have been potassic/silic deformed at random anomalies and minor red beds and boudins have been brittly deformed and faulted. These red units lie in a ground matrix of green siltstone. The whole package of rock has been subsequently fractured, faulted and silicified. Late fracture fillings contain quartz and chlorite which have been offset and healed by very late stage carbonate, (ankerite?).									
		11'9" - The core of an open F_1 style tectonic fold occurs with a > 24" wavelength.									
		12' - B.A. @ 50 degrees to the C.A.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 2 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		16' - B.A. @ 45 degrees to the C.A. and cross-cutting fracture cleavage lies @ 40 degrees to the C.A. 16'4"-18'11" - A zone of rubble with blocks of intact siltstone occurs, this appears to be a late stage block movements along original fractures and foliations. 17' - B.A. @ 40 degrees to the C.A. and cross-cutting fracture cleavage lies @ 30 degrees to the C.A. 21' - B.A. @ 40 degrees to the C.A. - cross-cutting fracture cleavage lies @ 25 degrees to the C.A. 21'6"-22'8" - Shearing occurs @ 0 degrees to the C.A., and is healed by quartz, chlorite and 3-5% disseminated sulphides. 22'7" - A series of small parasitic F_1 type Z-S folds occur with 1/8" wavelengths, another series occurs @ 24'3". 25'3" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage lies @ 40 degrees to the C.A. and slickenslides subparallel the B.A. 25'-29'5" - The core is broken up into variable sized blocks and fragments which are the result of shearing. This shear zone contains abundant disseminated sulphides, ~3-5%. 29'8"-32'2" - Potassic/silic alteration of grey-green and red siltstones is extensive, and overprints previous fracturing, faulting and shearing. 31' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. & over-printing shears occur @ 10-20 degrees in both orientations. 32'8"-34' - Chloritization dominates the alteration, the B.A. lies @ 25 degrees to the C.A., parallelling mylonization and cross-cutting fracture cleavage lies @ 65 degrees to the C.A. 34'6" - B.A. @ 25 degrees to the C.A., cross-cutting fracture cleavage @ 55 degrees to the C.A. 34'-41' - Potassic/silic alteration predominates over chloritic	87-5-20 87-5-30	20.00 30.00	30.00 40.00	10.00 10.00					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 3 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		alteration, within this zone the sulphide content can approach 15%. 39' - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage @ 50 degrees to the C.A. 41' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 70 degrees to the C.A. 41'-70'3" - The siltstones have been heavily chloritized and contain a 4-6" band of potassic/silic alteration and associated sulphides. 41'4" - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 43'-43'5" - Broken core. 44'10"-45'9" - Broken core, B.A. @ 35 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 47' - A bedding parallel F_1 very tight fold occurs, with the up-core limb @ 90 degrees & the down-core limb @ 10 degrees to the C.A. with a 1" wavelength. 48'-48'6" - A zone of chaotic folding and faulting occurs, the F_1 folds are very open and have 2" wavelengths, these folds are recumbent and do not reorientate the bedding. The B.A. lies @ 40 degrees on average to the C.A. and quartz and chlorite filled fractures lie between 20-80 degrees to the C.A., late stage open faults have removed marker beds beyond the scale of the core, ie. 1 1/2". 51' - B.A. @ 78 degrees to the C.A., assumed core perpendicular fold hinge, cross-cutting fracture cleavage @ 20 degrees to the C.A., the B.A. has been block faulted and failed boudins occur with light green siltstone layers; faults subparallel B.A. also, however, these faults do cut the bedding @ low angles. 52'6" - B.A. @ 18 degrees to the C.A., subparallel shears are common with a 3" spacing (average) between each. 52'8"-56'5" - Broken core in blocks and fragments. 56'7" - The grey-green siltstone is spotted with rust from iron sulphides.	87-5-40	40.00	50.00	10.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 4 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		57'4" - Assymetrical folding occurs with a 1/4" wavelength, the random orientation and style indicates severe ductile flow of this section. 58' - B.A. @ 40 degrees to the C.A., a stockwork of quartz carbonate veins cross-cut & subparallel the B.A. These fracture fillings range from 0-25 degrees to the C.A. 60' - B.A. @ 60 degrees to the C.A. 60'8"-65'3" - Ground, broken and missing core, blocky remains exhibit slickenslided surfaces, fault planes criss-cross the C.A. @ ~40-60 degrees to the C.A. 65'3"-66' - Intensely chloritized & sericitized core. 66'-70'11" - Broken, blocky core, intensely chloritized/ sericitized core, sections of the core are completely healed fault breccia. The clasts are mostly sericitized siltstone & angular quartz vein material.	87-5-60	60.00	70.25	10.25					
70'3"	87'11"	Red Siltstone: This unit has been intensely altered potassically, siliceously and chloritically; it has been severely mylonized, sheared & faulted during & after the extensive alteration phase. 71'9"-72'8" - A fault lies @ 3 degrees to the C.A., the slickenslides are very well defined & lie @ 80 degrees to the C.A. 76'4" - Recumbent F_1 folding occurs with a 1" wavelength, B.A. @ 45 degrees to the C.A. 77'6"-78' - Brecciation occurs healed by epidote, chlorite, rhodochrosite & quartz. 78'4" - The core of an F_1 style open fold occurs with the up-core limb @ 30 degrees & the down-core limb @ 20 degrees to the C.A. The inter-limb angle is 50 degrees, the wavelength is > 5".	87-5-70	70.25	80.00	9.75					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 5 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		79'-79'6" - Broken fragments of core which bound intact breccia. 79'10" - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage overprints the up-core breccia zone and lies @ 40 degrees to the C.A. 81'-81'6" - Fracture planes are coated in pyrolusite, these lie @ 20 degrees to the C.A. & overprint the B.A. @ 40 degrees to the C.A. 82'-84' - Four F_1 style tectonic folds occur with wavelengths of > 6" between them; the pattern is overprinted in a heavily sericitized section and is continued from 86'-87'6". This unit is discontinuous into the next zone and is bounded by a fault plane that lies @ 5-20 degrees along a curved surface plane.	87-5-80	80.00	87.92	7.92					
87'11"	100'2"	<u>Interbedded Grey-Green and Red Siltstone:</u> This alteration is the same as the unit 10'-70'3"; however, boudinaged bedding is rare while folding is more apparent. Faulting, shearing & brecciation are common. 89' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A., faults overprint the B.A. & fractures @ 40 degrees to the C.A. Chlorite heals many of these faults. 90'4" - An F_1 style tectonic fold occurs, the up-core limb lies @ 62 degrees to the C.A. and the down-core limb lies @ 24 degrees to the C.A., slightly recumbent with major dip of beds unchanged. 92' - B.A. @ 22 degrees to the C.A. Green siltstone boudins occur. 93'5" - An F_1 tectonic open fold occurs with a > 5" wavelength. Up-core limb lies @ 30 degrees to the C.A.	87-5-87	87.92	95.00	7.08					

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DIAMOND DRILL RECORD

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

HOLE NO. 87 - 5 SHEET NO. 6 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		and the down-core limb lies @ 30 degrees to the C.A. 94'1" - Tight F_1 recumbent, tectonic fold occurs; B.A. @ 55 degrees to the C.A. 94'7"-95'7" - A fault occurs cross-cutting B.A. @ 15 degrees to the C.A., B.A. @ 12 degrees to the C.A. 96' - B.A. @ 28 degrees to the C.A., cross-cutting fracture cleavage @ 45 degrees to the C.A. 99'6" - B.A. @ 22 degrees to the C.A., cross-cutting fracture cleavage @ 50 degrees to the C.A. Fractures healed with chlorite, epidote & quartz.	87-5-95	95.00	100.17	5.17					
100'2"	108'	<u>Red Siltstone With Minor Green Siltstone:</u> Potassic/silic and chloritically altered with late quartz/chlorite filling fractures, minor boudins. 102' - Core of an F_1 style tectonic fold occurs with a > 6" wavelength. B.A. @ 6 degrees to the C.A., cross-cutting fractures @ 53 degrees to the C.A. Many fractures sheared & healed by quartz & chlorite, core parallel fold hinge. 104' - B.A. @ 28 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A.	87-5-100	100.17	108.00	7.83					
108'	151'2"	<u>Interbedded Grey-Green & Red Siltstone:</u> Alteration is chloritic, silicic, and minor potassic within red siltstone, boudinaged beds uncommon. 108' - B.A. and cross-cutting fracture cleavage @ 32 degrees to the C.A. 110' - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage @ 50 degrees to the C.A.	87-5-108	108.00	118.00	10.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 7 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		113'6" - B.A. @ 15 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A.									
		114'6" - B.A. @ 0 degrees to the C.A., cross-cutting fracture cleavage @ 45 degrees to the C.A., core parallel fold hinge.									
		118' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 60 degrees to the C.A.	87-5-118	118.00	128.00	10.00					
		116'-120' - Core brown-red color.									
		120'-122'6" - Core blocky & broken, slatey cleavage, B.A. @ 50 degrees to the C.A.									
		123' - B.A. @ 50 degrees to the C.A.									
		124'3"-125' - Quartz-chlorite vein cross-cutting B.A. @ 10 degrees to the C.A., B.A. @ 45 degrees to the C.A.									
		126'6", - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A.	87-5-128	128.00	138.00	10.00					
		129' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A.									
		131' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A.									
		133' - B.A. @ 52 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A.									
		135' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A.									
		137' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A.									
		139' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A.	87-5-138	138.00	151.17	13.17					
		141' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A.									
		141'3"-141'9" - Fault cuts the B.A. @ 20 degrees to the C.A.									
		143' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A.									
		145' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 15 degrees to the C.A.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 8 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		147' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 22 degrees to the C.A. 147'1"-149'7" - Brown-red siltstone, bedding obscure. 149' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 45 degrees to the C.A. 151' - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 12 degrees to the C.A. This unit is structurally continuous into the next zone.	87-5-151	151.17	160.00	8.83					
151'	356'6"	<u>Interbedded Maroon-Red & Brick-Red Siltstone With Minor Grey-Green Siltstone:</u> In general, this unit has undergone little alteration, except minor sections within the overall red siltstone. These potassic/silic altered sections may originally have been grey-green siltstones. Boudinaged beds are common throughout this unit, particularly in the red siltstone parts. Sulphide mineralization only exceeds 1% in the potassically altered sections. 151'-157'10" - Interbedded grey-green & minor red siltstone occurs at the top of this unit. The lithologies are gradational into the predominately red iron formations below. 153' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 153'6"-157' - Brown-red siltstone, bedding indistinct. 155' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 157' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A. 159' - Core of an F_1 open tectonic fold occurs with a > 3' wavelength, the up-core limb lies @ 45 degrees and the down-core limb lies @ 40 degrees to the C.A., both									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 9 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		limbs lie parallel to each other.									
		161' - B.A. & cross-cutting fracture cleavage @ 40 degrees to the C.A.	87-5-160	160.00	180.00	20.00					
		163' - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A.									
		165' - B.A & cross-cutting fracture cleavage @ 45 degrees to the C.A.									
		167' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A.									
		169' - B.A. & cross-cutting fracture cleavage @ 45 degrees to the C.A.									
		171' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 38 degrees to the C.A.	87-5-170	170.00	172.00	2.00					
		173' - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A.									
		175' - B.A. @ 30 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A. which is healed with quartz, carbonate & wavellite?									
		175'7"-182'3" - Blocky & fragmented broken core.									
		177' - B.A. @ 55 degrees to the C.A., fractures & faults lie in average from 0-40 degrees to the C.A.									
		182'4"-182'11" - Fault cross-cuts core & lies @ 3 degrees to the C.A.	87-5-180	180.00	200.00	20.00					
		183' - B.A. @ 60 degrees to the C.A.									
		185' - B.A. @ 60 degrees to the C.A.									
		185'3"-186' - Brecciated green siltstone.									
		186'4"-187'4" - Breccia healed red siltstone which is broken & blocky, fault planes lie @ 20-40 degrees to the C.A.									
		188'6" - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 25 degrees to the C.A.									
		189'2"-195'3" - Zone of grey-green siltstone occurs.									
		191' - B.A. @ 40 degrees to the C.A.									
		192'-195'5" - Blocky & broken core.									
		193' - B.A. @ 25 degrees to the C.A., fractures parallel									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 10 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		& cross-cut B.A. @ 20-40 degrees to the C.A.									
		195' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A., many of the fractures are dilated & healed with wavellite & carbonate.									
		197' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A.									
		199' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A.									
		200'-200'10" - Broken & rubbly red siltstone.	87-5-200	200.00	220.00	20.00					
		201' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A.									
		203' - B.A. @ 45 degrees to the C.A.									
		205' - B.A. @ 60 degrees to the C.A.									
		207' - B.A. @ 65 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. filled with quartz, wavellite & minor carbonate.									
		209' - B.A. @ 60 degrees to the C.A., subparallel fracture cleavage @ 30 degrees to the C.A.									
		211' - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 50 degrees to the C.A., fractures are healed by quartz, carbonate & minor wavellite.									
		213' - B.A. @ 70 degrees to the C.A.									
		213'11"-219'5" - Zone of broken & blocky core.									
		215'5" - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 55 degrees to the C.A.									
		219' - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A.	87-5-220	220.00	240.00	20.00					
		221' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A.									
		223' - B.A. @ 64 degrees to the C.A.									
		223'8"-225'8" - Broken & blocky core.									
		225' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A.									
		227' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 11 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		226'9"-228' - Broken & blocky core, breaks along bedding planes. 229' - B.A. @ 40 degrees to the C.A. 231' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the C.A., subparallel fracture cleavage @ 55 degrees to the C.A. 231'-231'8" - Slatey cleavage occurs. 233' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 233'2"-235'4" - Broken & blocky core. 236' - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 236'-236'9" - Zone of healed brecciation of red siltstone. 237'-237'5" - An F_1 tectonic assymetrical folding with a 2" wavelength occurs, up & down core limbs lie @ 40 degrees to the C.A. 237'10"-238'11" - Broken & blocky core. 239' - An F_1 recumbent fold occurs with a 1/4" wavelength lying parallel to B.A. @ 55 degrees to the C.A.									
		240'-242' - Broken & blocky core, breaks mainly along bedding planes. 240'10" - Core of several F_1 recumbent tectonic folds, with both limbs lying parallel to same dip of the B.A. @ 45 degrees to the C.A. 240'10"-241' - Band of green siltstone within red siltstone, contains secondary bismuth, galena? & pyrite. 241'2"-241'4" - Same thing occurs, this zone however, contains red siltstone boudins. 243' - B.A. @ 50 degrees to the C.A. 245' - B.A. @ 45 degrees to the C.A.	87-5-240	240.00	245.00	5.00					
		247'5" - Core of an F_1 open tectonic fold occurs, the up-core limb lies @ 85 degrees & the down-core limb @ 20 degrees to the C.A. 248'1" - Core of an F_2 open fold occurs, plunges about 26 degrees, inter-limb angle is ~130 degrees.	87-5-245	245.00	255.00	10.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 12 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		248'-250' - Zone of intense P_1 tectonic folds occur with 1/2" wavelengths, transposition of limbs occurs along parallel shear planes. 249'-252' - Broken & blocky core, in this zone there are open fractures @ 5-10 degrees subparallel to portions of the bedding. 252' - B.A. @ 30 degrees to the C.A. 254' - Boudinaged beds lie @ 60 degrees to the C.A. 257' - B.A. @ 50 degrees to the C.A. 258' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 55 degrees to the C.A. 260'6" - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees to the c.A. 261'4"-262'2" - Broken & blocky core, breaks subparallel to B.A., slickenslided planes abound @ 75 degrees to C.A. 262' - B.A. @ 0 degrees to the C.A., core parallel fold ,hinge. 263'6"-264' - Broken & blocky core, breaks along bedding planes. 265' - B.A. @ 15 degrees to the C.A. 267' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A. 269' - B.A. @ 70 degrees to the C.A. 270'7"-274'5" - Predominately grey-green siltstone with minor red beds. 273' - B.A. @ 50 degrees to the C.A.	87-5-255	255.00	275.00	20.00					
		275' - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A. 275'6" - Band of wavellite subparallels fracture cleavage @ 20-25 degrees to the C.A. 276' - B.A. @ 57 degrees to the C.A., cross-cutting and subparallel to fracture cleavage @ 30 degrees to the C.A. 277'6" - Zone of wavellite cross-cuts B.A. & subparallels fracture cleavage @ 33 degrees to the c.A. 279' - B.A. @ 55 degrees to the C.A., cross-cutting	87-5-275	275.00	295.00	20.00					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 13 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		fracture cleavage @ 40 degrees to the C.A. 281' - B.A. @ 60 degrees to the C.A. 282'7" - Core of an F_1 tectonic open fold with the up-core limb @ 53 degrees & the down-core limb @ 50 degrees to the C.A., inter-limb angle is @ 103 degrees. 283'7"-292' - Zone of broken & blocky core. 289'5"-292' - Lost core. 285' - B.A. @ 60 degrees to the C.A. 287'4"-287'9" - Zone of wavellite parallelling fracture cleavage @ 20 degrees to the C.A., B.A. @ 55 degrees to the C.A. 293' - B.A. @ 60 degrees to the C.A. 294'-297' - Broken & blocky core. 295' - B.A. @ 65 degrees to the C.A., core breaks along bedding planes, many of which have slickenslides along them. 296' - B.A. @ 65 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees & subparallel fracture cleavage @ 40 degrees to the C.A. 297' - B.A. @ 60 degrees to the C.A. 299' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 40 degrees & subparallel fracture cleavage @ 40 degrees to the C.A. 301' - B.A. @ 55 degrees to the c.A., cross-cutting fracture cleavage @ 32 degrees to the C.A. 303' - B.A. @ 49 degrees to the C.A. 304'1" - Core of an F_1 open tectonic fold occurs, the up-core limb is broken and sheared, the down-core limb lies @ 40 degrees to the C.A. 305' - B.A. @ 50 degrees to the C.A.	87-5-293	295.00	305.30	10.30					
305'4"	356'8"	Evenly spaced interbeds of green-black & maroon-red siltstone, each zone averages approximately 6".	87-5-305	305.30	315.00	9.70					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 14 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		307' - B.A. @ 50 degrees to the C.A., bedding has a slight slatey cleavage. 309' - B.A. @ 60 degrees to the C.A., rock breaks along bedding cleavage into 2-4" blocks. 311' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 54 degrees to the C.A. 312'6" - B.A. @ 35 degrees to the C.A., cross-cutting fracture cleavage @ 52 degrees to the C.A., wavellite subparallels fracture cleavage.									
		315' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 42 degrees to the c.A. 317' - B.A. @ 38 degrees to the C.A., cross-cutting fracture cleavage @ 54 degrees to the C.A. 317'3"-317'5" - Zone of chlorite. quartz, feldspar, and epidote producing a granitic looking rock. 318'10"-319'10" - Red siltstone is brecciated & healed by quartz, chlorite, carbonates, pink feldspar?, epidote and pyrite. 329' - B.A. @ 65 degrees to the C.A. 331' - B.A. @ 65 degrees to the C.A., cross-cutting fracture cleavage @ 50 degrees to the C.A. 333' - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 20 degrees to the C.A.	87-5-315	315.00	335.00	20.00					
		335' - B.A. @ 70 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. & often healed by chlorite & quartz. 336'8"-341'5" - Zone of cataclastic brecciation healed by quartz, chlorite & minor carbonate. 343' - B.A. @ 40 degrees to the C.A., cross-cutting fracture cleavage @ 45 degrees to the C.A. 344'4" - B.A. @ 47 degrees to the C.A., cross-cutting fracture cleavage @ 10-20 degrees to the C.A. 344'11"-345'11" - Chlorite filled slickenskided fault @ 10 degrees to the C.A. 346'6" - B.A. @ 50 degrees to the C.A., cross-cutting	87-5-335	335.00	356.50	21.50					

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 15 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	%	%	OZ/TON	OZ/TON	
		fracture cleavage @ 27 degrees to the C.A. 348'6" - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the c.A. 350'6" - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 25 degrees to the C.A. 351'6" - B.A. @ 60 degrees to the C.A., cross-cutting fracture cleavage @ 25 degrees to the C.A. 353' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 45 degrees to the C.A. containing quartz & chlorite along replacement zones. 355' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A. 356' - B.A. @ 50 degrees to the C.A., cross-cutting fracture cleavage @ 30 degrees to the C.A.									
356'6"	462'	<u>Interbedded Grey-Green & Green-Black Siltstone:</u> Contains minor boudins of red siltstone & several thick sections of brown-red siltstone. Alteration is predominately chlorite. 357' - B.A. @ 62 degrees to the C.A., cross-cutting fracture cleavage @ 25 degrees to the C.A. 359'11"-362' - Broken & blocky core. 361' - B.A. @ 60 degrees to the C.A. 363' - B.A. @ 45 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A. 364'-365' - Sheared chloritic siltstone, shears @ 20-30 degrees to the C.A. 366' - B.A. & cross-cutting fracture cleavage @ 40 degrees to the C.A. 366'-367'4" - Broken & blocky core. 367'4"-368' - Lost core. 369' - B.A. @ 45 degrees to the C.A.	87-5-356	356.50	370.00	13.50					

M.R.R. MARITIME RESOURCE RESEARCH LIMITED

NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 16 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
			87-5-370	370.00	390.00	20.00					
370'10"	420'11"	Zone of interbedded grey-green & brown-red siltstone, repeated spacing occurs @ 1'-2'.									
		371' - B.A. @ 55 degrees to the C.A., fault or shear @ 17 degrees to the C.A.									
		373' - B.A. @ 45 degrees to the C.A.									
		377' - B.A. @ 45 degrees to the C.A., parting occurs along B.A. in 1"-5" blocks.									
		379' - B.A. @ 50 degrees to the C.A.									
		381' - B.A. @ 50 degrees to the C.A.									
		383' - B.A. @ 50 degrees to the C.A.									
		379'-386'7 - B.A. @ 40-50 degrees in general to the C.A., however, the strike of these beds rotates around the C.A. The effect is that the beds are rotating through roughly 360 degrees to an arbitrary bedding strike plane within 2-3 foot intervals in the core. Cross-cutting fracture cleavage @ 28 degrees to the C.A.									
		385' - B.A. @ 40 degrees to the C.A.									
		387' - B.A. @ 40 degrees to the C.A.									
		389' - B.A. @ 40 degrees to the C.A.									
		390'-391'6" - Broken & blocky core, shear planes lie @ 30 degrees to the C.A.	87-5-390	390.00	410.00	20.00					
		393' - B.A. @ 50 degrees to the C.A.									
		395' - B.A. @ 45 degrees to the C.A.									
		397' - B.A. @ 50 degrees to the C.A.									
		399' - B.A. @ 45 degrees to the C.A.									
		401' - B.A. @ 40 degrees to the C.A.									
		401'-401'6" - Grey-green beds are dispupted, stretched, block-faulted with 1/4" displacements.									
		403' - B.A. @ 50 degrees to the C.A.									
		407' - B.A. @ 45 degrees to the C.A.									
		409' - B.A. @ 50 degrees to the C.A.									
		413' - B.A. @ 50 degrees to the C.A.									
		417' - B.A. @ 45 degrees to the C.A.									

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NAME OF PROPERTY Woodstock PLYMOUTH OREBODY

DIAMOND DRILL RECORD

HOLE NO. 87 - 5 SHEET NO. 17 of 17

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE TOTAL	%	%	OZ/TON	OZ/TON	
		419' - B.A. @ 60 degrees to the C.A. 423' - B.A. @ 60 degrees to the C.A. 424'-427' - Broken & blocky core, in this zone the B.A. lies @ 55 degrees to the C.A., fault subparallels bedding and cross-cuts at angles up to 60 degrees to the C.A. 427'6" - B.A. & cross-cutting fracture cleavage @ 40 degrees to the C.A. 430'6" - B.A. @ 55 degrees to the C.A., cross-cutting fracture cleavage @ 35 degrees to the C.A. 431'-434' - Lost core, minor fragments remain. 437' - B.A. @ 45 degrees to the C.A. 438' - B.A. @ 55 degrees to the C.A. 442' - B.A. @ 60 degrees to the C.A. 462' - End of Hole	87-5-430	430.00	440.00	10.00					